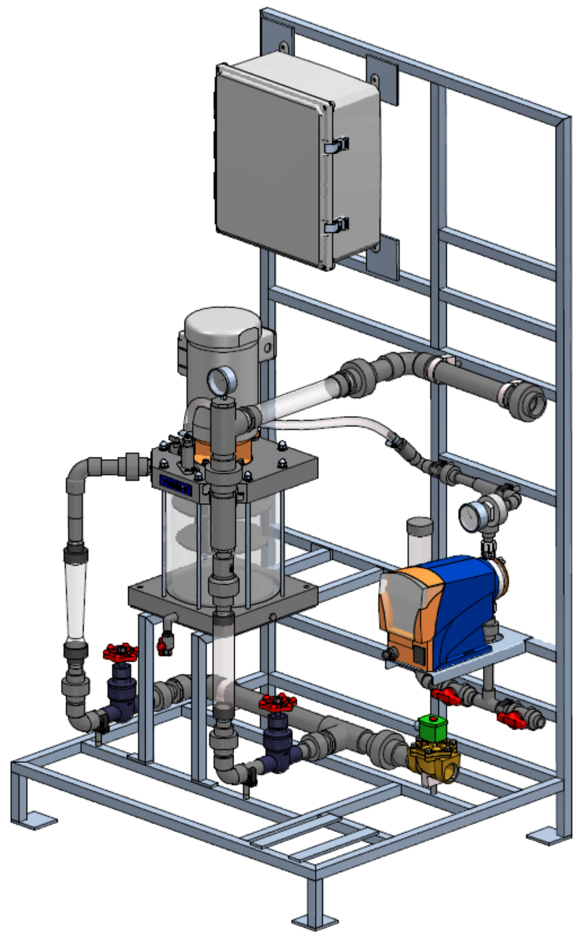
Operating Instructions
ProMinent® ProMix-M (Inline Controls)
Polymer Blending System



Please completely read through these operating instructions first! Do not discard!

The warranty shall be invalidated by damage caused by operating errors!

ProMix_MA_IOM (02/17/14): – P/N: XXXXXX

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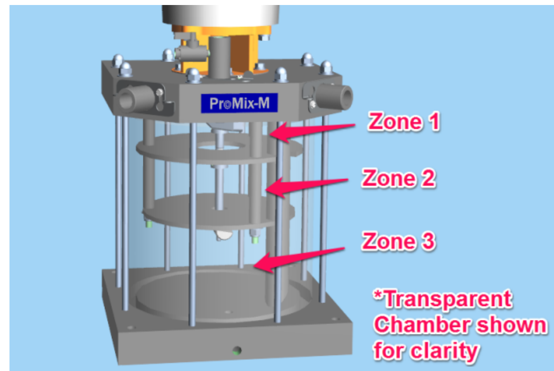
Table of Contents

ProMinent ProMix 'DA' & 'PA' Polymer Feeder

i. Overview:

The ProMix M Polymer Feeder is a skid system designed to control feed water and polymer and combine them to produce a high quality solution. The system is designed to receive liquid neat polymer while mixing it with feed water to produce and discharge a quality solution from the system.

Research in the science of polymer activation indicates that the activation energy must decrease as the polymeric chain is uncoiled to prevent rupture and hence decrease the performance of the product.



The mixing of the Polymer Feeder is accomplished mechanically with three distinct mixing zones separated by baffles. The first zone consists of a fast mixing blade that delivers high shear at the precise point of polymer injection, creating and immediate dispersion before agglomeration takes place. The second zone mixing blade induces a vortex and draws solution down through the center of the chamber from zone one and forces the solution outward to the sides and then down into zone 3. Finally, the third zone mixing blade gently agitates/blends the active polymer solution before it exits the chamber through the bottom of the discharge tube.

The ProMix M Polymer Feeder controller permits several operation options using the 'A' controller . These options and their respective configurations are selected using various combinations of the controller door switch positions and polymer type selections. The controller allows the polymer pump speed to be selected either locally (keypad) or remotely (4-20 mA signal) from 0 to 100%. The polymer dosage rate must be calculated and the pump adjusted for the desired ratio concentration of polymer to dilution water leaving the feeder by volume. Different maximum concentrations are possible based upon the type of polymer. Emulsion polymers should be limited to 1% concentration in the mixing chamber and Mannich polymers should not exceed 10%. These polymer types are selectable from the keypad menu.

The System Start switch on the controller door has three positions ON-OFF-REMOTE. ON enables the controller locally and REMOTE enables the controller via a customer supplied dry contact. The Polymer Pump switch has two positions LOCAL-REMOTE. If the pump speed is to be selected using the keypad on the controller door then the Polymer Pump switch should be moved to the LOCAL position. When the pump is to be controlled via a remote 4-20 mA signal then REMOTE should be selected.

Placing the System Start switch in the OFF position after having first been in either of the other two positions will initiate a flush cycle before shutting down. The Polymer Pump switch on the controller front door has two positions to choose the source of the pump control signal. In the LOCAL position the controller uses the keypad entry for polymer pump speed. In the REMOTE position the user generated 4-20 mA signal represents 0 – 100% pump speed. The user must manually adjust the primary and post dilution valves for the desired dilution water flow rate and must calculate the required pump speed to attain the desired concentration. Rotameters are provided to monitor the dilution water flow rates.

The design incorporates an electric solenoid valve (water inlet), flow meter/switch, manually adjustable rotameters for primary and post dilution flow, peristaltic neat polymer pumps, microprocessor based controller, manual ball valves, pump calibration column, PVC piping and components, and polymer mixing chamber mounted on a skid to facilitate proper mixing and delivery.

ii. ProMix Systems:

Diaphragm Pump Type DLTA (DA Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
1048367	300X2-2.3DA	Delta 1020-120	2.3 GPH
1048368	600X2-3.8DA	Delta 1020-200	3.84 GPH
1048369	600X2-6.2DA	Delta 0730-200	6.16 GPH
1048370	600X2-10.3DA	Delta 0450-200	10.3 GPH
1048371	1200X2-6.2DA	Delta 0730-200	6.16 GPH
1048372	1200X2-10.3DA	Delta 0450-200	10.3 GPH
1048373	1500X2-6.2DA	Delta 0730-200	6.16 GPH
1048374	1500X2-10.3DA	Delta 0450-200	10.3 GPH

Refer to Appendix C for proper sizing

Overall Skid Dimensions..72”H x 40”W x 34”D
Overall Weight of Skid .... 220 lbs
Power Requirements .... 120VAC, 60Hz, 1 Phase, 20 Amp
Volume of Mixing Chamber ....3.2 Gallons
Maximum Rated Chamber Pressure .... 150 PSIG
Normal Operating Pressure .... 58 PSIG to 100 PSIG (Depends on Pump Selected)
Recommended Running Temperature .... +50°F to 100°F
Water Connection Size .... 1-1/2” FNPT
Solution Discharge Connection Size .... 1-1/2” FNPT

Progressive Cavity Pump Type (PA Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
1048375	300X2-5.0PA	Seepex MD	5.0 GPH
1048376	600X2-5.0PA	Seepex MD	5.0 GPH
1048377	600X2-10.0PA	Seepex MD	10.0 GPH
1048378	1200X2-10.0PA	Seepex MD	10.0 GPH
1048379	1200X2-24.0PA	Seepex MD	24.0 GPH
1048380	1500X2-10.0PA	Seepex MD	10.0 GPH
1048381	1500X2-24.0PA	Seepex MD	24.0 GPH

Refer to Appendix C for proper sizing

Overall Skid Dimensions .... 72"H x 40"W x 34"D
Overall Weight of Skid .... 250 lbs.
Power Requirements .... 220VAC, 60Hz, 1 Phase, 20 Amp
Volume of Mixing Chamber .... 3.2 Gallons
Maximum Rated Chamber Pressure .... 150 PSIG
Normal Operating Pressure .... 58 PSIG to 100 PSIG (Depends on Pump Selected)
Recommended Running Temperature .... +50°F to 100°F
Water Connection Size .... 1-1/2" FNPT
Solution Discharge Connection Size .... 1-1/2" FNPT

iii. Diaphragm Polymer Pumps used on M Models:

Series	Identification Code	Factory Default Mode	SPM Max	Flowrate (GPH)		Pressure (PSIG)
				Min @ 100% Stroke	Max @ 100% Stroke	
DLTA	DLTA1020PVT4600UD4031EN0	HV2	120	0.019	2.3	145
DLTA	DLTA1020PVT4600UD4031EN0	Standard	200	0.019	3.84	145
DLTA	DLTA0730PVT4600UD4031EN0	Standard	200	0.031	6.16	102
DLTA	DLTA0450PVT4600UD4031EN0	Standard	200	0.11	10.32	58

Notes:

1. ProMinent - Delta Solenoid Driven Metering Pump
2. Original Pump GPH rating is derated 20% due to Polymer viscosity. The actual deration may vary depending on the polymer used
3. Control Modes Available *
    a. Standard – 200 spm: 0-50 cp
    b. HV1 (slightly reduced discharge speed) – 180 spm: 50-200 cp
    c. HV2 (moderately reduced discharge speed) – 120 spm: 200-500 cp
    d. HV3 (maximum reduced discharge speed)– 80 spm: 500-1000 cp
4. Connections: ½” x 3/8” or DN10 Depending on Model Selected
5. Power Requirements: 115VAC, 60 Hz, Single Phase

* Viscosity values are approximate and can vary widely per specific application. Use these values as a guideline only and consult the factory for specific application capabilities

iv. Progressive Cavity Polymer Pumps used on M Models:

Series	Identification Code	SPM Max	Flowrate (GPH)		Pressure (PSIG)
			Min	Max	
MD	MD 003-12 / A6-A7-A7-H0-GA-X			2.3	100
MD	MD 006-12 / A6-A7-A7-H0-GA-X			3.84	100
MD	MD 012-12 / A6-A7-A7-H0-GA-X			6.16	100

Notes:

1. Seepex Progressive Cavity Metering Pump
2. Original Pump GPH rating is derated due to Polymer viscosity. The actual deration may vary depending on the polymer used
3. Power Requirements: 220VAC, 60 Hz, Single Phase

* Viscosity values are approximate and can vary widely per specific application. Use these values as a guideline only and consult the factory for specific application capabilities

1.0 INSTALLATION & QUICK START GUIDE

1.1 Safety:

Utilize appropriate protective safety gear when operating or maintaining this equipment. Recommended safety gear is as follows:

Personal Protective Equipment (PPE):

- Hard Hats (Where overhead hazards exist)
- Safety Glasses with side shields
- PVC Apron
- PVC Gloves
- Safety-Toed Work Boots

1.2 Delivery & Storage Checklist:

1. Check packing list for completeness and note any missing items immediately.
2. Inspect equipment and shipping container for damages before accepting delivery. Make note on the carrier's bill-of-lading the extent of the damage, if any, and notify the carrier.
3. Store the equipment on firm level surface in original packing container. Do not store the equipment where it may be exposed to extreme temperatures, precipitation, humidity, or dust. Avoid direct sunlight that could overheat and damage equipment.

Ambient Conditions for storage and transport:

Temperature:	14°F to 120°F
Air Humidity:	≤ 92% relative humidity, non-condensing

1.3 Installation Considerations:

- Required Polymer System Voltage
- Available Water Pressure
- Injection Point Pressure
- Number of Injection Points
- Polymer Solution Discharge: For example (Length of Piping Run and Pipe Size)
- Neat Polymer Suction: Flooded or Lift
- Type of Application / Dewatering Device
- Type of Polymer: Emulsion, Dispersion, Solution

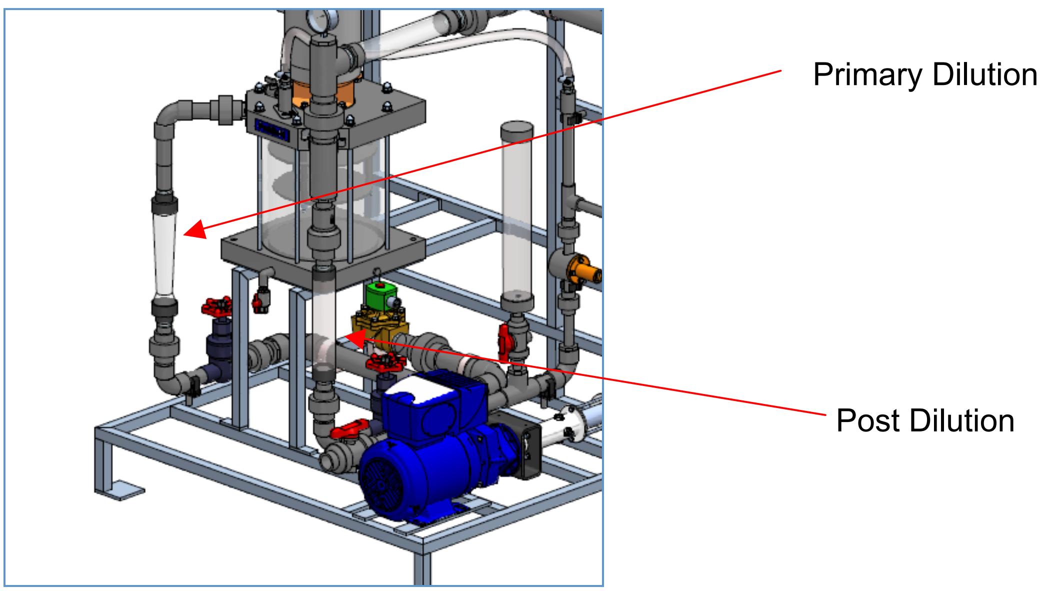
1.4 Installation:

1. Unpack and position equipment on sturdy level surface. Fasten to prevent movement.
2. Do not install equipment in areas of extreme heat, cold, dust or humidity. Avoid areas where objects or fluids can drop from overhead.
3. Units are to be installed as close to the point of application as possible.
4. Inlet pressure is not to exceed 100 psig working pressure.
5. System pressure at the discharge is not to exceed 80% of inlet pressure.
6. Piping Internal to the System:
    a. Inspect the piping for breakage. The system may have been jarred during shipping.
    b. Check the tightness on all unions. Hand tighten only – no tools. Unions incorporate an o-ring seal. Ensure that the o-ring is seated properly prior to tightening.
7. Piping External to the System *(Reference Appendix A for connection location)*:
    a. Install piping so that connections properly meet system termination points. Do not "stretch" field installed piping to meet system termination points. Stressed piping will fail!
    b. Piping should be at a minimum ¾" to and from the piping on the system. 1" or larger piping is recommended. Larger piping sizes would be required for runs over 100 feet in length if utilizing ¾" pipe.
    c. Avoid getting dirt and debris inside the piping during installation. Plug ends of piping with rags if construction activities are underway. All debris must be flushed from piping before system start-up.
    d. Connect to outlet piping 1-1/2" FNPT from static mixer to associated customer application point.
    e. Connect to make-up water inlet piping 1-1/2" FNPT (25 GPM maximum at 100 psig maximum).
    f. Connect to Neat Polymer pump inlet piping ½" FNPT (DLTA Models) & 1" FNPT (Seepex Models). Flooded Suction ONLY for Seepex PC pump.
    g. Install 1-1/2" pressure regulator and 1-1/2" y-strainer / basket strainer on the clean make-up water line if equipment is currently not installed. (Recommended). Sizing depends on inlet/outlet piping.
    h. Allow provisions for draining the system piping. Skid components will require maintenance. Ensure that chemicals can be evacuated from the skid piping and components for servicing.
8. Electrical Supply Needed for the System:
    a. Note: Review local Electrical Code and follow accordingly.
    b. Connect incoming power to skid mounted control panel *(120VAC, Single Phase, 20 Amp, 60 Hz).* Ensure panel is properly grounded.
    c. Check electrical connections to be sure proper voltage is supplied to the system.
    d. Power the unit using a dedicated, separate breaker in the local lighting distribution panel.
    e. Do not route the AC power in common conduit with variable frequency pump drives.
    f. Do not put conduit entries in the top of the control panel. Resulting conduit condensation and failure to seal may damage controller circuit boards.
9. The Overload relay should be set to the Motor Nameplate Full Load Amps. Setting this to a higher value will result in possible damage to the motor and associated wiring. Overload conditions should be investigated and possible process changes may need to be made to prevent overload conditions.

10. Connect Digital Remote Start Functions (note wiring termination points in Appendix B) for polymer tank level and remote start permissive. Default jumpers should remain in place for any input not available.
11. Refer to the Delta or Seepex pump manual (Reference Document) for pump operation.

1.5 Quick Start Guide:

1. Review installation portion (Section 1.4) of the manual.
2. Open ball valve on the suction of the pump to allow chemical to flow into the system by gravity. If the application is suction lift then ensure liquid is present in pump suction.
3. Start up pumps at 100% stroke length and frequency to purge all air and prime the system. To prime the DLTA pump press and hold the UP/DOWN Arrows on the keypad until chemical is visible in the suction line. The Seepex pump must have a flooded suction.
4. Verify motor rotation on Mixing Chamber motor. Normal rotation is CCW.
5. Do not run the mixing chamber motor dry. Damage to the mechanical seal could occur.
6. Close the Secondary flow control valve and adjust the Primary flow control valve to obtain the flow range required. If additional dilution water is needed adjust the secondary accordingly.



7. Verify that the maximum polymer injection pump pressure is higher than the system pressure.
8. Perform pump calibration using drawdown calibration cylinder. See section 2.12.
9. Check flow calibration and be sure pump meets or exceeds the rated flow capacity. Check flows at 100% capacity.
10. In System Start ON and Polymer Pump LOCAL switch positions the neat polymer pump speed is adjusted manually using the controller keypad to change the pump rate from 0 to 100% of the pump rated output.
11. In System Start ON and Polymer Pump REMOTE switch positions the controller receives a remote customer supplied analog 4-20 mA signal to adjust the desired pump speed from 0 to 100% of the pump rated output. This remote 4-20 mA signal can be scaled at the controller to enhance the resolution of the pump output control and bias the pump response

to the remote signal. A remote start permissive is optional – if used then System Start switch should be in the REMOTE position.

12. Confirm proper operation of all instrumentation. For example: Gauge, Rotameter switch, etc.
13. Input functions checked and simulated (remote start/stop, 4-20mA, etc.).
14. Output functions checked.
15. Test the operation of all remaining circuits.
16. Observe system to assure that nothing looks or sounds abnormal.

1.6 ProMix Options for Polymer Settings and Controller Door Switches

Begin by first selecting type of polymer (Emulsion or Mannich) see section 2.5.

Emulsion or Mannich The type of polymer being used by the ProMix feeder is selected. If emulsion then a maximum of 1.0% concentration is permitted in the mixing chamber. If Mannich is selected then the maximum is 10.0% concentration.

After setting polymer type, manually adjust the two door switches, ‘System Start’ and ‘Polymer Pump’ for the desired operating conditions:

System Start door switch

Permits use of remote contact to enable system operation in REMOTE position.

Polymer Pump door switch

Determines the setpoint for pump control action which can be from the keypad entry in LOCAL or from a 4-20 mA signal in REMOTE.

Mannich polymer door switch options

System Start **ON-OFF-REMOTE** controller door switch	**Polymer Pump** **LOCAL-REMOTE** controller door switch	**PROMIX OPERATION**
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100 % pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-100% pump speed Max. chamber concentration: 10.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-100% pump speed Max. chamber concentration: 10.0%

ProMinent ProMix 'DA' & 'PA' Polymer Feeder

Emulsion polymer door switch options

System Start **ON-OFF-REMOTE** controller door switch	**Polymer Pump** **LOCAL-REMOTE** controller door switch	**PROMIX OPERATION**
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0 –100% pump speed Max. chamber concentration: 1.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–100% pump speed Max. chamber concentration: 1.0%

1.7 Servicing Guidelines:

- Disconnect electrical power to the equipment prior to servicing.
- Relieve all pressure from the unit prior to servicing.
- Close all suction and discharge valves.
- Verify dilution water is closed.
- Drain chemical/water from unit prior to disassembly.
- Maintain protective covers over all moving parts.
- Keep body parts, hair and foreign objects from contact with moving parts.
- Do not allow grease or oil to be used or stored around the feed equipment or chemicals.
- Review the Material Safety Data Sheets of the Polymer utilized and observe appropriate safety measures.
- Mineral Oil can be utilized to aid in the polymer cleaning process.

Ensure all operating & maintenance personnel are instructed regarding the contents of this manual.

2.0 CONTROLLER

2.1 Keypad Navigation

The ProMinent ProMix M Polymer Feeder uses a fixed configuration to deliver the operation required to operate the feeder. The main board is not interchangeable with other ProMinent controller hardware.

The top line of the main menu displays the current feeder state on power ON

Press **EXIT** during any main menu display & you’ll return to the top of the menu & the current feeder state.

The other main menu displays show information you’ll need to set & adjust feed rate and to verify flowswitch, 4-20mA in & out…

UP & **DOWN** to view options or to EDIT numbers

Move **RIGHT** to select next field when EDITing

ENTER to select an option & to execute EDITing

EXIT to escape option, info display or EDITing
EXIT goes to top of **Main Menu**



2.2 Main Menu

Description	Display
This is the power ON, top of the menu display. Press **EXIT** at any display to return here. Displays the **Polymer** feed rate 0-100% and the current state of the feeder. See 1.6 for complete state table.	Polymer 38.6% Auto RUN
Displays the **Polymer Pump** feed rate 0-100% and the controlling 4-20mA current level, Press **ENTER** @ **Polymer Pump** to view-adjust the Manual Setpoint & Calibrate the 4-20mA controlling the pump.	Polymer Pump ON 38% 10.1mA
Mixer ON time resets to zero every time the **Mixer** turns OFF.	Mixer ON 49.1 Mins
	Alternates every second
Press **ENTER** during **Auto RUN** or **Manual RUN** to turn OFF the **Polymer Pump** and flush the mixer.	Mixer Flush on ENTER
The **Remote Setpoint** 4-20mA current loop controls the **Polymer Pump** in **Remote RUN** mode. Press **ENTER** to calibrate.	Remote Setpoint 38% 10.1mA
Flowswitch ON time resets to zero every time the **Flowswitch** turns OFF. After 24 hours displays **>1Day**.	Flowswitch ON 3.45 Hrs
The **Remote Start** contacts must be closed for the polymer feeder to run. **Remote Start** time resets to zero every time the contact set opens.	Remote Start ON 1.36hrs
We’re now back at the top of the main menu.	Polymer 38.6% Remote RUN

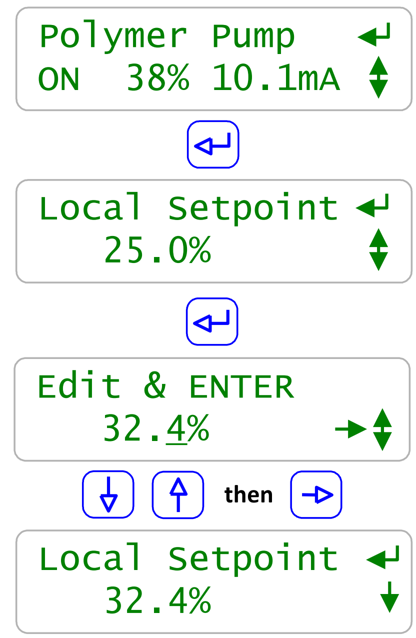
Sidebar:

Press **ENTER** at **Polymer** to view and adjust feeder **Fill**, **Flush** & **Wait-for-Flow** timing.

Press **ENTER** & **UP** at **Polymer** to view feeder **Diagnostics**. Refer to **2.17** for **Diagnostic** displays.

2.3 Adjust Setpoint

Adjust Local Setpoint



Press **ENTER** @ **Polymer Pump** to view or adjust the **Local Setpoint**.

Local Setpoint may be adjusted at any time If Polymer Pump switch is set to Local mode.

The present **Local Setpoint** is **25.0%.** Press **ENTER** to adjust.

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

Displays new, adjusted **Local Setpoint**. Press **EXIT** to return to main menu.

If the Polymer Pump switch is in the **Local** position, any adjustment takes effect immediately, modifying the 4-20mA output to the pump.

Sidebar:
Local Setpoint only controls the polymer pump when the Polymer Pump switch is @ Local.

If the **Local Setpoint** is @ 25% the 4-20mA current output loop will be at 8mA (4mA + 0.25 x 16mA = 8mA).

Remote Setpoint only controls the polymer pump when the Polymer Pump switch is @ Remote. The polymer pump speed is then controlled by the remote 4-20 mA signal.

2.4 Modify Timing

Press **ENTER** @ **Polymer**

to view or adjust the feeder timing.

Fill Time is the time that the feeder waits to fill the feeder prior to turning on the **PolymerFeed** pump. This protects the mechanical seal of the mixer motor shaft by keeping it wet. Minimum time is 30 seconds for the first fill only. Thereafter this step is skipped if operation pauses unless electrical power to the controller is cycled. Key **ENTER** to modify.

Flush Time is the time water flows after initiation of a Flush Cycle. This is a maintenance feature and can be manually initiated by (1) placing the controller door System Start Switch in the OFF position for more than 2 seconds or (2) by opening the remote start contact for longer than 2 seconds or (3) by using the keypad menu. Key **ENTER** to modify time.

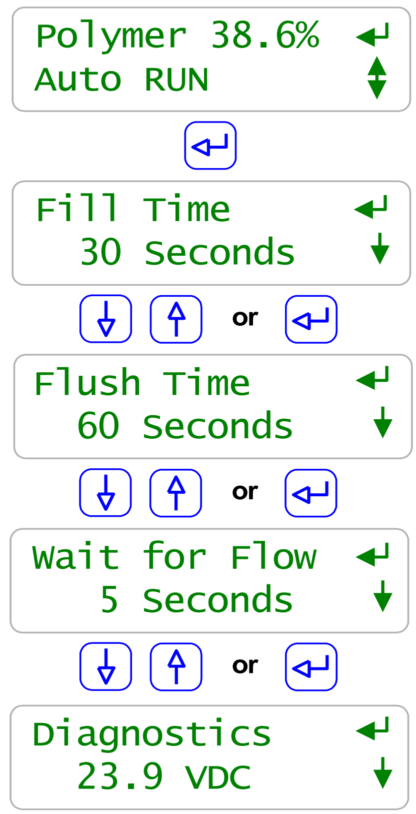
Wait for Flow may be adjusted to any time from 1 to 30 seconds. Press **ENTER** to adjust.

Diagnostics displays the input current loop power voltage.

Press **ENTER** to view diagnostic data set.

Refer to 2.17 for detail.

View Timing



Sidebar:

Wait for Flow: Water inlet solenoid open, ON. Mixer and Polymer Pump both OFF.

Factory default = 5 seconds.

The 4-20mA current loop control input may be powered by the site control system

or by the ProMix M 24VDC power supply.

Adjust Timing

Press **ENTER** @ **Polymer** to view or adjust the **Fill Time**, **Flush time** or **Wait for Flow** time.

```
Polymer 38.7%
Auto RUN
```

All three times are adjusted in the same way.
In this example we'll press **ENTER** @ **Fill Time**.

```
Fill Time
  30 Seconds
```

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit.
Key **EXIT** to abandon or **ENTER** to execute.

```
Edit & ENTER
  45 Seconds
```

then

Displays new, adjusted **Fill Time**.
Press **EXIT** to return to main menu.

```
Fill Time
  45 Seconds
```

If you **ENTER** a time less than 1 second, the **Fill Time** will be set to 1 second.

Low Limit response

```
Fill Time
   1 Seconds
```

If you **ENTER** a time greater than 60 seconds, the **Fill Time** will be set to 60 seconds.

High Limit response

```
Fill Time
  60 Seconds
```

Sidebar:

Fill Time: Minimum = 1 second, Maximum = 60 seconds.

Factory default = 30 seconds.

Flush Time: Minimum = 1 second, Maximum = 120 seconds.

Factory default = 60 seconds.

Wait for Flow: Minimum = 1 second, Maximum = 30 seconds.

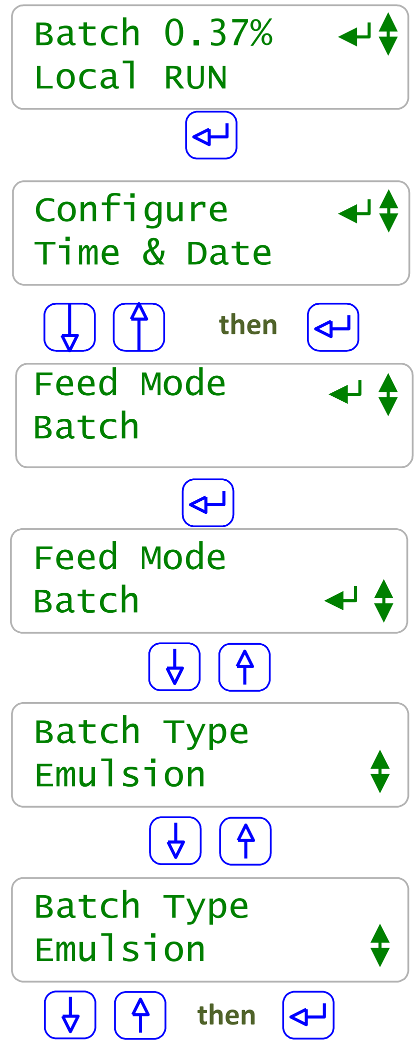
Factory default = 5 seconds.

2.5 Change Polymer type

Top of Main Menu. Displays current feeder state.
Key **ENTER** @ to view & adjust System settings
You can always key **EXIT** until you get to this screen

Key **ENTER** @ **Configure** and use **DOWN** key to access **Feed Mode**.

Key **DOWN** to **Batch Type** and Key **ENTER**. View-adjust the **Batch Type** to either **Emulsion** or **Mannich.** **Key ENTER** when the desired polymer type is displayed.



2.6 Manually Flush Mixer

Flush Mixer

```
Mixer
ON    49.1 Mins
```

Alternates every second

```
Mixer
Flush on ENTER
```

Press **ENTER** @ **Mixer**
When the **Mixer ON** time display is alternating with the **Flush on ENTER** display.

```
Mixer
ON    50.8 Mins
```

Alternates every second

```
Mixer
Flush  26sec
```

The polymer feed pump will turn OFF.
The Mixer & water inlet solenoid will remain ON while the alternating **Mixer** display counts down the flush period.

At the end of the Flush period the ProMix M will return to the Remote RUN or Local RUN state unless the user:

1. Sets the ON-OFF-REMOTE switch to OFF.
2. Shuts off the feeder inlet water.
3. Opens the Remote Start contacts.

Sidebar:

Flush Time: Minimum = 1 second, Maximum = 120 seconds.

Factory default = 60 seconds.

2.7 Status Message Summary

LCD Displays	Feeder State
Offline STOP	Feeder powered. On-Off-Remote switch at Off.
Lin<4mA, Fault	Local-Remote switch at Remote and 4-20mA input less than 4 mA. Exits on 4-20mA >= 4 mA or On-Off-Remote = Off or On
Flow Check	Waits user set seconds for Flowswitch contact set closed after Filling Mixer. Exits on flowswitch closed or On-Off-Remote = Off
No Water STOP	Exits on flowswitch closed or On-Off-Remote = Off
Filling Mixer	Inlet Solenoid ON & Mixer OFF. Waits user set seconds to fill mixer. Exits on On-Off-Remote = Off
No Ext.Run STOP	Polymer Pump, Mixer and Solenoid OFF Exits on Remote Start contacts closed or On-Off-Remote = Off
Flushing Mixer	Solenoid & Mixer ON. Polymer pump OFF. Exits on flush time expired or No flow or On-Off-Remote = Off
Flush Fail STOP	No Flow measured while flushing. Exits on flush time expired or flow measured or On-Off-Remote = Off
Remote RUN	Polymer pump @ 4-20mA input controlled setpoint. Exits on no flow, control<0%, flush, Remote Start open, or On-Off-Remote = Off or Local.
Local RUN	Polymer pump @ user setpoint. Exits on no flow, flush, Remote Start open or On-Off-Remote = Remote or Off.
Flushed, Stopped **Press ↵ to Run**	Flush ends. Polymer Pump, Mixer and Solenoid OFF Any key press restarts.

Sidebar:

Flow Check: The flowswitch monitors dilution water flow into the mixer chamber.

Filling Mixer: The mixer chamber is filled once after every power ON.

If you drain the mixer, switch the power OFF then ON to re-fill the mixer chamber.

2.8 Calibrate 4-20mA Input

Calibrate 4-20mA In

Press **ENTER** @ **4-20 mA Input** to calibrate the 4-20mA current loop input from the site’s control system

```
Remote Setpoint↵
 38% 10.1mA    ↕
```

4-20 mA Input may be calibrated at any time in Remote or Local mode.

↵

The present **4-20 mA Input** is **38.7%.** Press **ENTER** to calibrate.

```
Calibrate Iin  ↵
  38.7%
```

↵

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

```
Edit & ENTER
  36.9%       →↕
```

↓ ↑ **then** →

Displays new, adjusted **Remote Setpoint**. Press **EXIT** to return to main menu.

```
Calibrate Iin  ↵
  36.9%        ↓
```

If the Local-Remote switch is in the Remote position, any adjustment takes effect immediately and modifies the 4-20mA output to the polymer pump.

Sidebar:

‘Calibrate Iin’ matches the % display on the polymer feeder with the remote operator’s % display.

The underlying 4-20mA level is of less importance than having both of the % displays

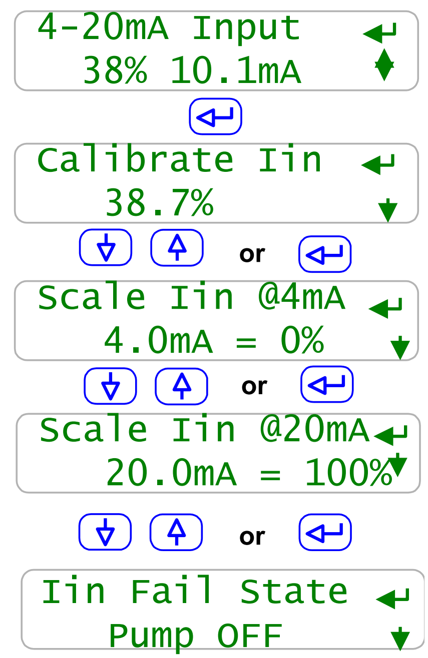
(the feeder’s & the remote operator’s) match because the Polymer feed pump operates from OFF at 0% to maximum ON at 100%.

It’s simpler to calibrate on a % instead of calibrating on a current and making a non-intuitive 4-20mA loop to 0-100% conversion.

So you don’t need to know that a 32.4% feed corresponds to a current loop @ 9.18 mA.The factory default scales the 4-20 mA input for 4mA = 0% Pump to 20 mA = 100% Pump.See Section 2.2 if your site’s 4-20 mA input is not scaled 4-20 mA = 0 to 100%

2.9 Scale the 4-20mA Input

4-20mA input sub Menu



Press **ENTER** @ **4-20 mA Input** to navigate the input current loop sub-menu

See the previous page for calibrating the 4-20 mA input loop

Press **DOWN** to view the present 4 mA pump feed percentage.
The factory default is as displayed. When the 4-20 mA input is at 4.0 mA the pump will be OFF.

Press **DOWN** to view the present 20 mA pump feed percentage.
The factory default is as displayed. When the 4-20 mA input is at 20.0 mA the pump will be 100%.

Press **DOWN** to view the response when the input current loop is less than 4.0 mA.
The factory default is as displayed. When the 4-20 mA input is less than 4.0 mA the pump will be OFF.

Press **ENTER** at any of the four sub-menu displays to modify the present setting.
Press **EXIT** to leave unchanged.

Sidebar:

Calibration of the 4-20 mA input ensures that the measured value of the 4-20 mA Input is displayed as the correct mA level.

Scaling the 4-20 mA input is required when you do not want 4-20 mA to correspond to a 0-100% polymer feed rate.

Selecting a different response than Pump OFF on loss of the 4-20 mA input allows for a wider range of site operational configurations & control loop reliability.

2.9 Scale the 4-20mA Input (continued)

Press **ENTER** @ **4-20mA Input** to calibrate the 4-20mA current loop input from the site's control system.

Press **UP** or **DOWN** to the **Scale lin @20mA** display & then press **ENTER**.

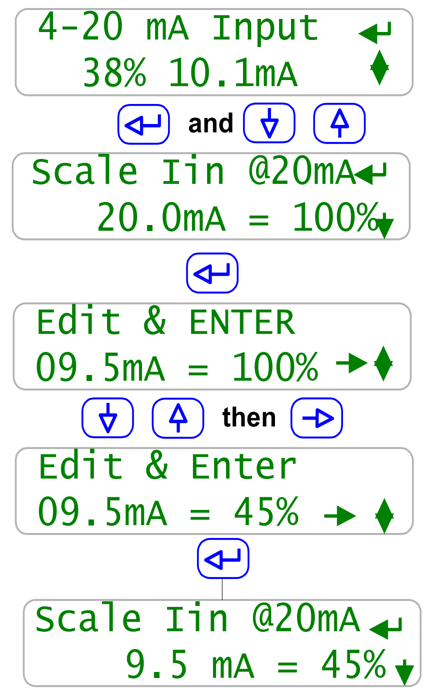
Press **RIGHT** to move the underline cursor & **UP** or **DOWN** to modify the value @ the cursor. Press **EXIT** to leave the present setting unchanged.

You can modify either or both of the mA level and the resulting pump feed %. Press **ENTER** when finished editing.

Displays new, adjusted **Scale lin @20mA**
Press **EXIT** to return to main menu.

Scale lin @4mA is modified in the same way.

Modify mA @ 100% ON



Edit either or both mA & %

Sidebar:
There's a lot of flexibility in the 4-20 mA input scaling & the corresponding pump speed but most users will leave 4mA=0% and adjust the mA @ 100% to allow 0-100% pump operation over a narrower range of 4-20 mA input.

For example, if you wish 0-15% of the 4-20 mA input to control the pump from 0-100%
Edit **Scale lin @20mA** for **6.4mA = 100%**
& leave **Scale lin @ 4 mA** unchanged at **4.0mA = 0%**

Setting the mA level below 4.0mA will set the mA level to 4.0mA
Setting the mA level above 21.0mA will set the mA level to 21mA

Setting the % above 100% will set the % to 100%. The % level cannot be set below 0%.
Refer to Appendix A for notes on 4-20mA Input scaling.

If you set % span to zero in error, the pump will turn OFF.
Note that you could make the current loop response reverse acting so that an increasing loop current will cause a decreasing pump %.

2.10 Response on Loss of 4-20 mA Input

View-Modify response On 4-20mA Input fail

Press **ENTER** at 4-20Ma input.

Press **UP** or **DOWN** to **Iin Fail State**.

Displays the factory default.
Pump OFF when **4-20mA Input** less than 4mA.
Press **ENTER** to select a different response.

Press **DOWN** to select a user set pump speed on less than 4 mA.

Displays the factory default of 10%.
Press **ENTER** to select response & modify value.

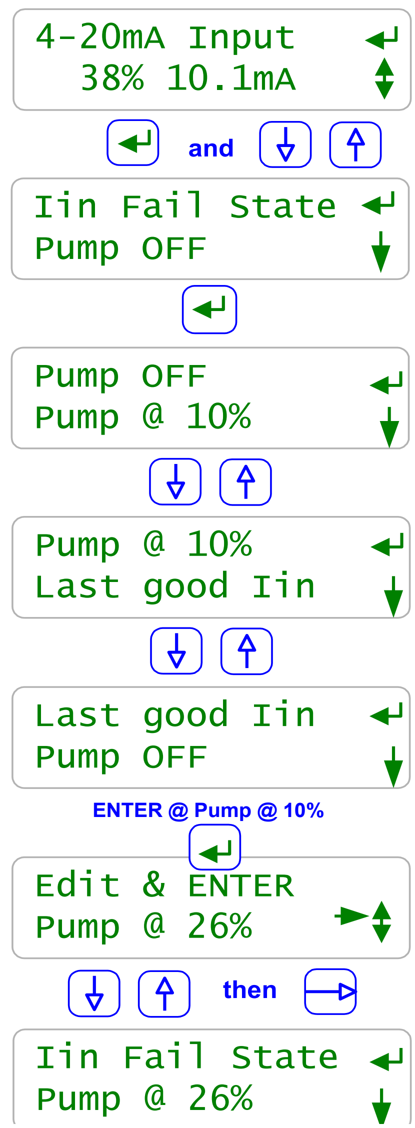
Press **DOWN and ENTER** to run the pump at the last input Value greater than 4.0mA when the measured current loop value falls below 4.0mA.

.

If you pressed **ENTER** @ **Pump @ 10%**
You will be able to modify the **10%** value.

Press **RIGHT** to move the underline cursor &
UP or **DOWN** to modify the value at the cursor.

Press **EXIT** to leave unchanged or **ENTER**
To set the new value.



Sidebar:
The feeder defines a failed 4-20mA input @ -1% which is nominally 3.85mA.
(4.0mA – 0.01 x 16.0mA = 3.84mA)

3.85mA allows 4.0mA, a valid pump control signal some headroom prior to a fault response

2.11 Calibrate 4-20mA Output

Calibrate 4-20mA Out

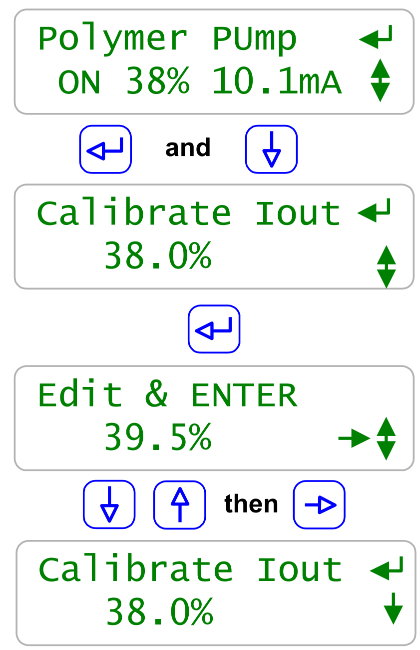
Press **ENTER** & **DOWN** @ **Polymer Pump** to calibrate the 4-20mA current loop output that controls the pump feed rate

The present **Polymer Pump** control is 38.0%
But the on-pump display is @ 39.5%
Press **ENTER** to calibrate.

Key **RIGHT** to move the cursor &
UP or **DOWN** to change the digit.
Key **EXIT** to abandon or **ENTER** to execute.

The ProMix M reduces the pump 4-20mA current
So that the on-pump display will measure 38.0%.
Press **EXIT** to return to main menu.

Any adjustment takes effect immediately and modifies both the 4-20mA output.



Sidebar:
‘Calibrate Iout’ matches the % display on the polymer feeder with the polymer feed pump’s % display (not all pump types display %, some display mA)
Note: 50% will not display 12mA after calibration. It will display the mA required for the pump to display 50% which could be 11mA to 13mA. Refer to 4.3 for 4-20mA reset.
Correction >10% blocked, displays “**Advice >10% Adj.Error**”. Press **EXIT** to clear.

Modifying Zero, <4%
At less than 4% the 4-20mA zero is modified to correct loop offset.
Example: Pump shows 0% and the ProMix M displays 1.5%.

Modifying Span, >6%
At more than 6% the 4-20mA span is modified to correct loop gain.
Example: Pump shows 52% and the ProMix M displays 50%

2.12 Operation Configuration

Set points

Control of the neat polymer feed pump is set by the **System Start** and **Polymer Pump** switches located on the ProMix control panel door. The type of polymer, either **emulsion** or **Mannich**, and the operation, either **Local** or **Remote,** are selected via the controller keypad or browser interface. Refer to the ProMix Mode and Polymer charts in section 1.6.

NOTE: In Batch mode the ProMix feeder adjusts the pump speed as the measured Primary & Post dilution flow rates vary to maintain the setpoint polymer concentration.

Feed Verification

Feed verification ensures that the polymer pump is actually delivering polymer by monitoring the output of the pump. Sometimes a thermal flow switch is employed for this purpose as an optional feature for 'other' type pumps selection. The Delta pump utilizes an integral relay for feed verification. See section 2.13 for further details.

Pump Calibration

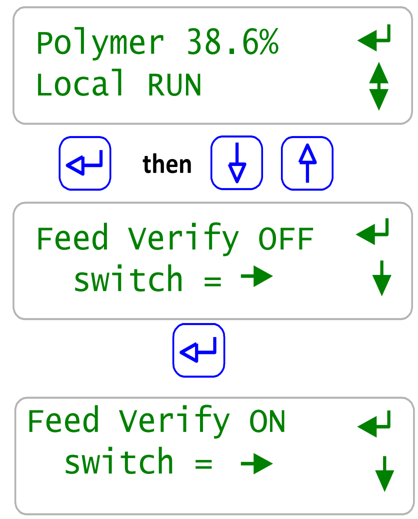
Before placing the ProMix system in operation the polymer pump should be calibrated at maximum dosing and the resultant gph rate entered into the configuration menu for pump size. A calibration cylinder is provided on most ProMix systems to assist in the calibration of the polymer pump. The following procedure should be followed to calibrate a Delta type pump, assuming all installation requirements are met:

1. Configure pump for manual operation, set desired suction viscosity spm, and set stroke length to 100%.
2. Fill calibration cylinder to top mark by manipulating valves & pump to allow neat polymer into the cylinder. Manually fill the calibration cylinder if it is not possible to use the pump output.
3. Keep ProMix feeder connected to the actual system so that maximum application back pressure is realized.
4. Open primary dilution water valve so that the mix chamber fills when system is started.
5. Manipulate pump valves so that pump suction is connected to the calibration cylinder only.
6. Manually run pump at maximum rated strokes per minute and time the calibration column drawdown for at least 30 seconds taking note of beginning and end marks. Calculate the gph pump rate from the volume and time.
7. Using the controller keypad, enter the calculated pump rate in gph
8. Place the pump back into the analog mode.

Follow the same procedure for a Seepex pump but do not use water for testing and/or calibration. Connect suction side of the Seepex pump to neat polymer or mineral oil only. Also use 'other' for the type of pump selected in the controller menu

2.13 Feed Verification

Verify on/off

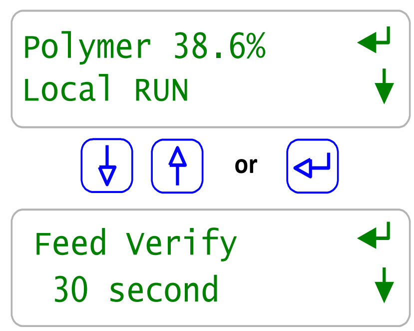


Press **ENTER** and **DOWN** @ **Polymer Pump** to navigate to the polymer pump feed verification option.

Feed Verify when switched **ON** is used to monitor the relay pulse output from the polymer feed pump verifying that the 4-20 mA signal from the controller is driving the pump. If this **Feed Verify** pulse signal is not active when the controller is sending the 4-20 mA control signal to the polymer pump then a pump failure alarm is actuated.

Feed Verify can also be turned **OFF** in the case where the polymer pump does not have the pulse feedback option. Press the **RIGHT** key to alternate between **ON and OFF** and press **ENTER** to modify. Press **EXIT** to return to main menu.

Verify time interval



Press **ENTER** and **DOWN** @ **Polymer Pump** to navigate to the polymer pump feed verification option pulse timing interval.

Feed Verify is the time delay between pulse signals and may be adjusted to any time from 1 to 30 seconds. If a pulse is not received within this time period and **Feed Verify** is **ON** then a pump failure alarm is actuated. Press **ENTER** to modify and press the **RIGHT** key to change values.

. Press **EXIT** to return to main menu

Sidebar:

The **Feed Verify** pulse signal from the pump is wired to the **FV** terminals on the Digital Input accessory board.

2.14 4-20mA Controls

0% defaults to 4.0 mA.
100% defaults to 20.0 mA.
The 4-20mA input current may be changed by adjusting the 4-20mA input scaling.

2.15 Troubleshooting Guide

Adjustment and bypass fixes to operational problems.

LCD Display	Operational Problem
No Control STOP	Switch the On-Off-Remote to On while you figure out the problem with the 4-20mA current loop connected to **mA In** input terminals '**I+**' & Ground ⏚ terminal. If the ProMix M **mA In** **24V** is powering the loop, view **Polymer / Diagnostic** to ensure >23VDC
No Water STOP	**Flowswitch OK?** If a flowswitch problem, jumper controller **Interlock** input terminal '**FS**' to the adjacent Ground symbol ⏚ terminal while you resolve. **Solenoid OK?** Verify that the solenoid has been actuated during the **Filling Mixer** and **Flow Check** states by cracking a downstream union. Verify 120VAC between **AC Power** terminal '**S**'olenoid & **Neutrals** terminals during the **Filling Mixer** and **Flow Check** states. **Fuse Fails?** If no AC solenoid power, verify solenoid wiring & coil not shorted & replace the solenoid fuse. It's the brown 2.5A fuse in the white socket above the **Neutrals** terminals. www.digikey.com Part# 7500413 Note that power to the mixer motor start relay coil shares the 2.5A solenoid fuse.
No Ext. Run STOP	If a Remote Start contact set problem, jumper controller **Interlock** input terminal '**RC**' to the adjacent Ground symbol ⏚ terminal.
Flush Fail STOP	This state occurs if flow lost during flushing. After flush time expires, goes to **No Water STOP**
Offline STOP	It the On-Off-Remote switch is not in the OFF position then there is either a lose connection @ the door mounted switch terminals or the red 3 wire connector below the keypad ribbon connector has been disconnected.

2.16 Diagnostic Display

Diagnostics

Press **ENTER** & **UP** @ **Polymer** for **Diagnostics**.

```
Diagnostics
  23.9 VDC
```

When initially programmed, the ProMix M serial number 1st letter is set to '**U**'. Manufacturing sets the 1st letter to '**P**'

```
Serial Number
U310PF001
```

Firmware Ver: is the software issue date. In this example 4/06/10.

```
Firmware Ver:
40610
```

An increasing number of **Watchdog Resets** indicates that the software is halting, typically as a result of an external electrical fault. Disconnect the **Interlock** **RC** inputs first, followed by the **mA In** **I+** & common inputs next.

```
Watchdog Resets
        0
```

If the feeder runs continuously or the **RC** input is used to STOP the feeder, there should be a low number of **Power OFF-ONs**. An unexplained, high number usually indicates accidental shutdown or AC power wiring problems.

```
Power OFF-ONs
        2
```

Relay ON/OFF display in the same order as wired and labeled on the ProMix M circuit board. **P**olymer enable, **R**unning, **W**ater Loss, **M**ixer, **S**olenoid. **P**,**R** & **W** are dry NO contacts, **M** & **S** are NO hot, 120VAC.

```
P  R  W  M  S
ON ON -  ON ON
```

This is the elapsed time on the **P**olymer enable contact set & therefore tracks the time spent in the **Remote RUN** & **Local RUN** states. It's saved to flash every hour so if powered OFF before an hour of ON time, ON time is lost.

```
Pump ON
  0Days, 2Hrs
```

This is the elapsed ProMix M AC powered time & meant to be compared to the previous **Pump ON** time. It's saved to flash every hour so if powered OFF before an hour of ON time, ON time is lost.

```
Powered   1Yrs
 46Days,14Hrs
```

The 4-20mA current input is locked to the 4-20mA current output when Remote selected. Both can be calibrated & occasionally mis-calibrated. Press **ENTER** to return to the factory defaults & a known state.

```
Reset Iin&Iout
ENTER resets
```

3.0 SPARE PARTS & PREVENTIVE MAINTENANCE

3.1 DELTA (DLTA) Pump Spare Parts

P/N:	*Description:*
1027082	DLTA1020 Spare Parts Kit**
1000249	DLTA1020 Diaphragm
1017393	DLTA1020 Liquid End
1027083	DLTA0730 Spare Parts Kit**
1000250	DLTA0730 Diaphragm
1017404	DLTA0730 Liquid End
1027084	DLTA0450 Spare Parts Kit**
1000251	DLTA0450 Diaphragm
1025138	DLTA0450 Liquid End

**Spare Parts Kit above includes the following:
(1) Diaphragm
(1) Suction Valve Set
(1) Discharge Valve Set
(2) Ball Valves (Check)
(1) Set of O-rings
(1) Connector Set

3.2 SEEPEX Pump Spare Parts

Consult Factory

3.3 PVC Mixing Chamber Spare Parts

P/N:	*Description:*
7746474	Seal, Mech, Shaft, 1/2", ProMix-U
7747244	Injection Valve, SG, ProMix
7746491	O-Ring, Chamber, Viton, ProMix-M
7500346	PVDF Insert - 1/16 NPT x 3/16 Hose Barb *(Seal Failure Fitting)*
7037004	Tubing PVC 3/16” x ¼” *(Seal Failure Tubing)*

3.4 Piping Components Spare Parts

P/N:	*Description:*
1019883	1/2" PVC Back Pressure/Pressure Relief Valve SOC pfc
7745788	0-160PSI, Gauge, SS, 2-1/2, Bottom MTD
7746152	0-160PSI 316SS Back gauge & CPVC/PTFE Isolator
7744091	1/2" ID PVC Nylobraid Hose
7741354	1/2" SS Hose Clamp
7740541	1/2" PVC Hose Barb Adapter H x MNPT

3.5 Control Panel Spare Parts

P/N:	*Description:*
7747276	C3C Overload 10-16 Amps Adjustable
7746223	CBI UL 489 Circuit Breaker 20 Amp
7500413	Littlefuse 2.5A 250V for Circuit Board
7746094	GLD2 Time Delay Fuse

3.6 Maintenance and Lubrication Schedule

MAINTENANCE		
Description / Task	**Remarks**	**Frequency**
Visual inspection of unit		Weekly
Check dosing line fittings and valves for tightness		Every 3 Months (Approx 30% continuous operation.)
Verify equipment is operating properly	No leaks or abnormal noises	Weekly
Check the electrical connections for integrity		Quarterly
Check tubing for wear or cuts		Weekly
Check Mixing Chamber Motor amperage. Check fan cover for obstruction or Dirt		Monthly
Check dosing diaphragm for damage (Delta Pump)		Every 3 Months (Approx 30% continuous operation.)
Check the liquid end for tightness (Delta Pump)	Torque Settings for screws 40 - 44 in/lb	Every 3 Months (Approx 30% continuous operation.)
Check leakage rate and tighten/loosen packing to allow 1-6 drops per minute (Seepex Pump)	Adjust tightening nuts only 1/2 turn per minute until stabilized	Weekly
Check flow pump rate at rated pressure (Seepex Pump)	Replace Rotor/stater as required	Weekly
Check Bearing End play and Temperature. Change Grease (Seepex Pump)	See Lubrication Chart	Monthly (3,000 Operation Hours)
Check Universal Joint Seal, Bushing and joint integrity. Replace Grease (Seepex Pump)	See Lubrication Chart	Upon rotor/stator replacement
Check Motor RPM/amperage. Drain. Check fan cover for obstruction or Dirt (Seepex Pump)		Monthly
Check Gear reducer temperature and oil level (Seepex Pump)	See Lubrication Chart	Monthly

ProMinent ProMix 'DA' & 'PA' Polymer Feeder

MAINTENANCE		
Description / Task	**Remarks**	**Frequency**
Change Gear reducer oil (Seepex Pump)	See Lubrication Chart	3 Years
Short Term – Flushing of Piping & Chamber	24 Hour Shut Down	Run 60 Second Flush
Long Term – Flushing of Piping & Chamber	24 Hour + or if large amount of polymer is dosed into chamber w/o water running	Run Water until piping is visibly clear in static mixer

LUBRICATION		
Description / Task	**Lubrication**	**Frequency**
Mixing Chamber Motor 3/4 Hp (See Chart Below)	Ball Bearing Grease	5,000 Hours of Service per Year
Check Gear Reducer Oil Level (Seepex Pump)	210cSt @ 40°C (Gulf EP Lube-S 100 or equal)	Weekly
Change Gear Reducer Oil Level (Seepex Pump)	210cSt @ 40°C (Gulf EP Lube-S 100 or equal)	3 Years
Repack Motor Bearing w/Grease	Gulf EP No. 2 or equal	3 Years
Repack Pump Bearing	Shell Alvania EP 2 or equal	3,000 Operating Hours
Repack Pump Universal Joints	Seepex Grease Type 30321 "ONLY"	Rotor Replacement or 10,000 operating hours whichever is first

Mixing Chamber Motor Lubrication Details:

Lubrication

This is a ball bearing motor. The bearings have been lubricated at the factory. Motors that do not have regrease capability are factory lubricated for the normal life of the bearings.

Relubrication Intervals (For motors with regrease capability)

New motors that have been stored for a year or more should be relubricated. Lubrication is also recommended at these intervals:

Relubrication Intervals

NEMA (IEC) Frame Size	Rated Speed (RPM)			
	3600	1800	1200	900
Up to 210 incl. (132)	5500Hrs.	12000Hrs.	18000Hrs.	22000Hrs.
Over 210 to 280 incl. (180)	3600Hrs.	9500Hrs.	15000Hrs.	18000Hrs.
Over 280 to 360 incl. (225)	*2200Hrs.	7400Hrs.	12000Hrs.	15000Hrs.
Over 360 to 5000 incl.(300)	*2200Hrs.	3500Hrs.	7400Hrs.	10500Hrs.

* Lubrication interval for 6313 or 6314 bearings that are used in 360 through 5000 frame, 2 pole motors. If roller bearings are used, bearings must be lubricated more frequently, divide the interval by 2.

Lubricant

Baldor motors are pregreased, normally with Polyrex EM (Exxon Mobil). If other greases are preferred, check with a local Baldor Service Center for recommendations.

Procedure

Clean the grease fitting (or area around grease hole, if equipped with slotted grease screws). If motor has a purge plug, remove it. Motors can be regreased while stopped (at less than 80°C) or running.

Apply grease gun to fitting (or grease hole). Too much grease or injecting grease to quickly can cause premature bearing failure. Slowly apply the recommended amount of grease, taking 1 minute or so to apply. Operate motor for 20 minutes, then reinstall purge plug if previously removed.

Caution: Keep grease clean. Mixing dissimilar grease is not recommended.

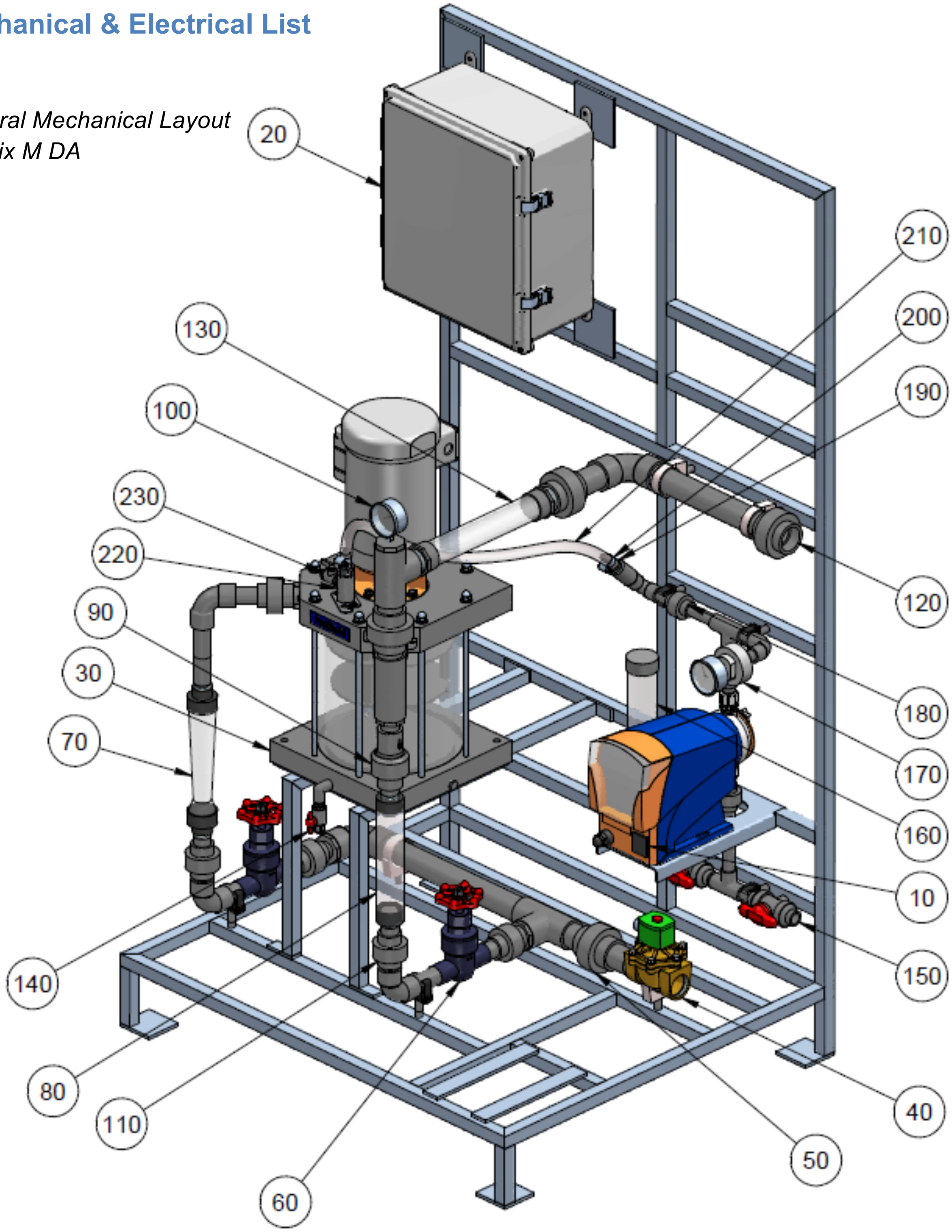
Amount of Grease to Add

Frame Size NEMA (IEC)	Weight of grease to add ounce (gram)	Volume of grease to add	
		$inches^3$	teaspoon
Up to 210 incl. (132)	0.30 (8.4)	0.6	2.0
Over 210 to 280 incl. (180)	0.61 (17.4)	1.2	3.9
Over 280 to 360 incl. (225)	0.81 (23.1)	1.5	5.2
Over 360 to 5000 incl.(300)	2.12 (60.0)	4.1	13.4

Appendix A – DA & PA Series Bill of Material

Mechanical & Electrical List

General Mechanical Layout
ProMix M DA



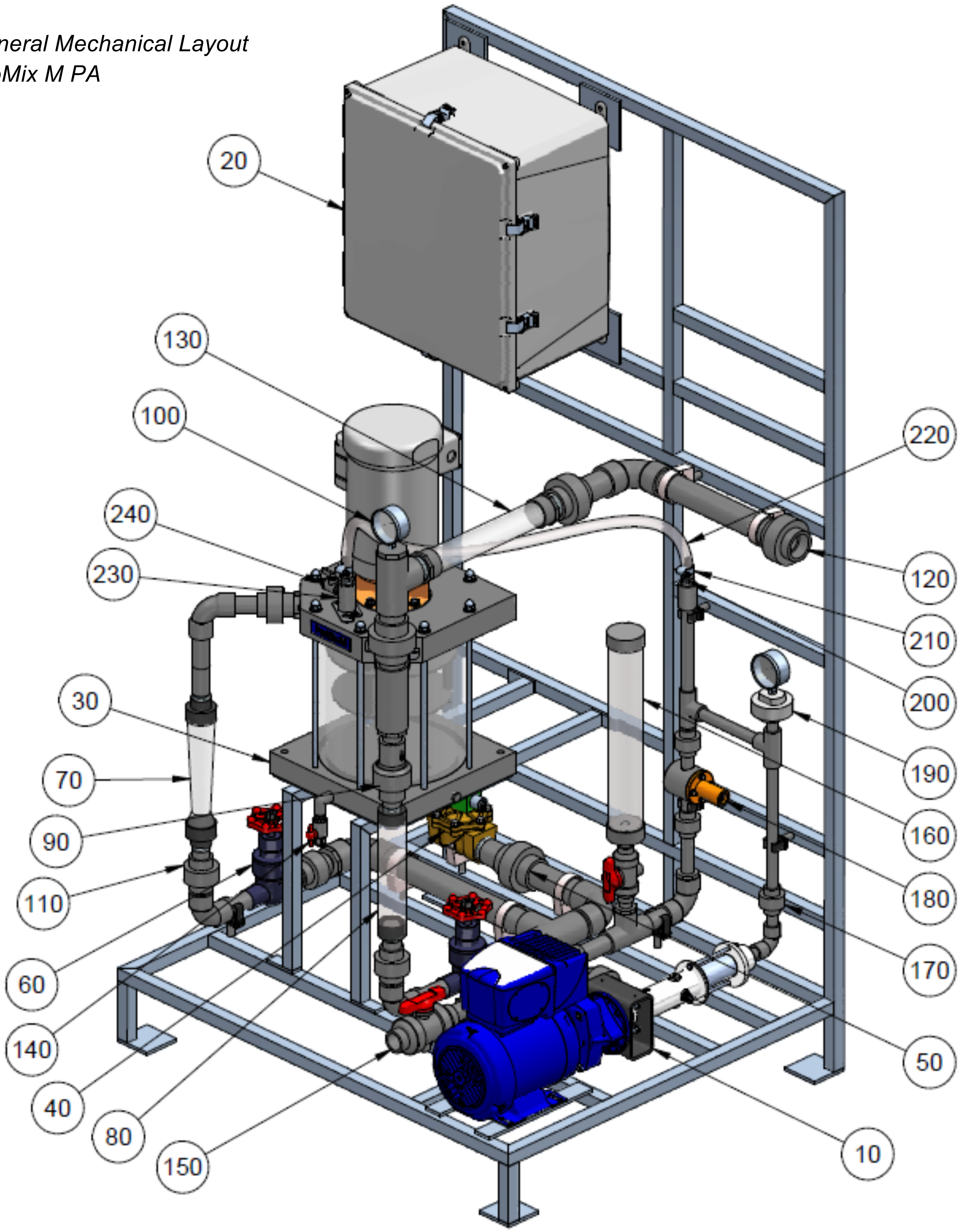
PROMIX M DA

PROMIX M (DA SERIES) BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO.	1048367	1048368	1048369	1048370	1048371	1048372	1048373	1048374
10	DELTA 1020 SERIES PUMP ON HV2 SETTING	DLTA1020PVT4600UD4031EN0	X							
	DELTA 1020 SERIES PUMP	DLTA1020PVT4600UD4031EN0		X						
	DELTA 0730 SERIES PUMP	DLTA0730PVT4600UD4031EN0			X		X		X	
	DELTA 0450 SERIES PUMP	DLTA0450PVT3600UD4031EN0				X		X		X
20	CONTROL PANEL	7747282	X	X	X	X	X	X	X	X
30	PROMIX M MIXING CHAMBER	7747253	X	X	X	X	X	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7746526	X	X	X	X	X	X	X	X
50	UNION, 1-1/2", SOCKET, PVC/VITON, SCH. 80	7744564	X	X	X	X	X	X	X	X
60	GLOBE VALVE, 1", SOCKET, PVC/EPDM	1048407	X	X	X	X	X	X	X	X
70	FLOW METER, 5 GPM, 3/4", FNPT, PVC, W\SWITCH	7746674	X							
	FLOW METER, 10 GPM, 3/4", FNPT, PVC, W\SWITCH	7746675		X	X	X				
	FLOW METER, 20 GPM, 1", FNPT, PVC, W\SWITCH	7746676					X	X		
	FLOW METER, 25 GPM, 1", FNPT, PVC, W\SWITCH	7746677							X	X
80	FLOW METER, 5 GPM, 1/2", FNPT, PVC	7746343	X							
	FLOW METER, 10 GPM, 1", FNPT, PVC	7746652		X	X	X				
	FLOW METER, 21 GPM, 1", FNPT, PVC	7746653					X	X		
	FLOW METER, 30.5 GPM, 1", FNPT, PVC	7746654							X	X
90	CHECK VALVE, 1", SKT, PVC	1048408	X	X	X	X	X	X	X	X
100	PRESSURE GAUGE, 316 SST, 0-100PSI	7741084				X		X		X
	PRESSURE GAUGE, 316 SST, 0-160PSI	7745788	X	X	X		X		X	
110	UNION, 1", SOCKET, PVC/VITON, SCH. 80	7744563	X	X	X	X	X	X	X	X
120	UNION, 1-1/2", FNPT, PVC/VITON, SCH. 80	7744559	X	X	X	X	X	X	X	X
130	STATIC MIXER, 1-1/2", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746529	X	X	X	X	X	X	X	X
140	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	X	X	X	X	X	X	X	X
150	BALL VALVE, 1/2", PVC/VITON, SCH. 80, TYPE 21	7000309	X	X	X	X	X	X	X	X
160	CALIBRATION COLUMN, PVC, 500mL	7500139	X	X	X	X	X	X	X	X
170	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-100PSI	7746151				X		X		X
	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-160PSI	7746152	X	X	X		X		X	
180	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	X	X	X	X	X	X	X	X
190	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X	X	X	X	X	X
200	HOSE CLAMP, 1/2", SST	7741354	X	X	X	X	X	X	X	X
210	TUBING, 1/2" ID, PVC, NYLOBRAID	7744091	X	X	X	X	X	X	X	X
220	INJECTION VALVE	7747244	X	X	X	X	X	X	X	X
230	BLEED VALVE, 1/8", PVC/VITON	7747237	X	X	X	X	X	X	X	X

ProMinent ProMix ‘DA' & 'PA’ Polymer Feeder

General Mechanical Layout
ProMix M PA

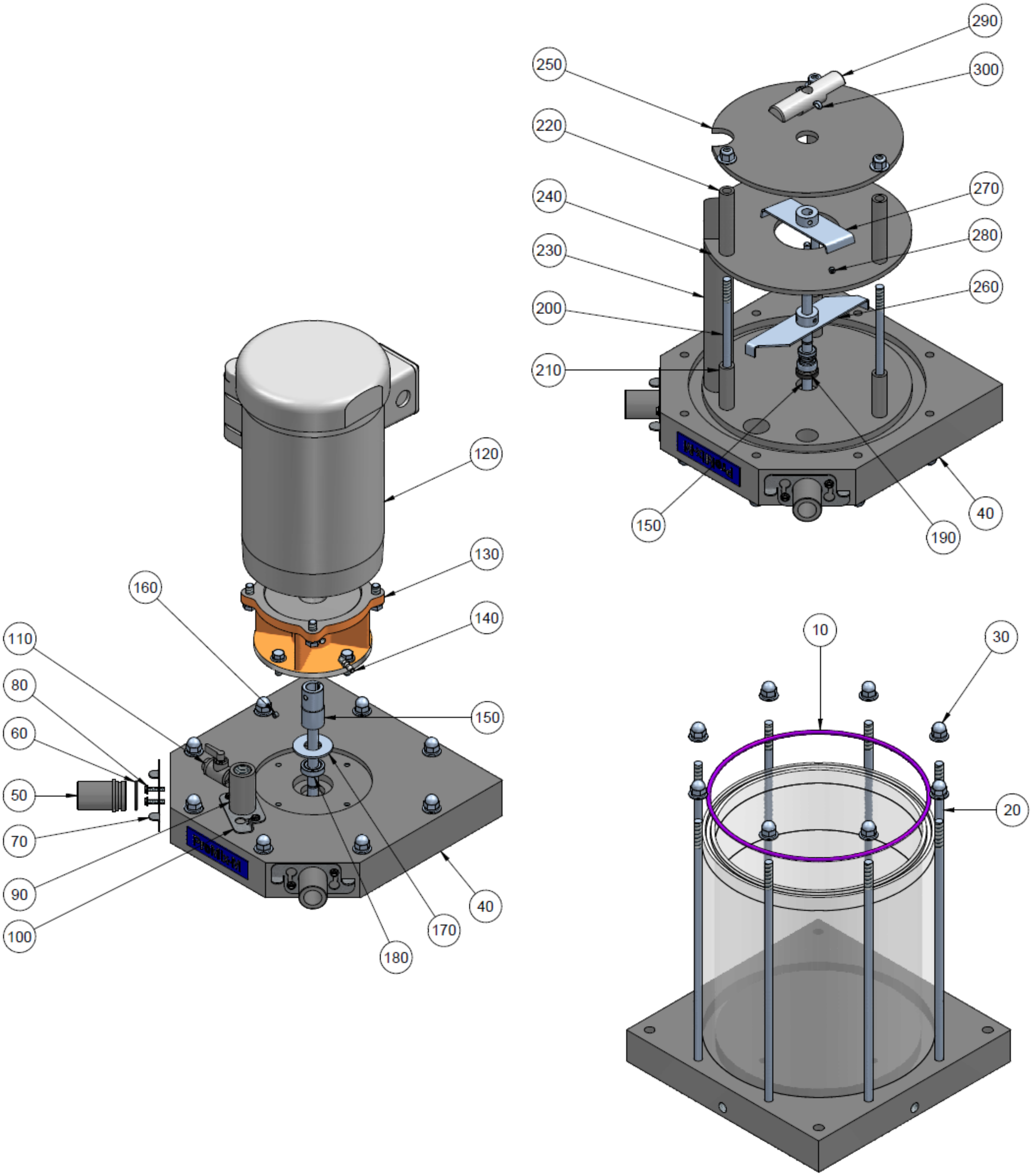


PROMIX M PA

PROMIX M (PA SERIES) BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO.	1048375	1048376	1048377	1048378	1048379	1048380	1048381
10	PUMP, 5 GPH, SEEPEX MODEL MD-003-012	1048415	X	X					
	PUMP, 10 GPH, SEEPEX MODEL MD-006-012	1048416			X	X		X	
	PUMP, 24 GPH, SEEPEX MODEL MD-012-012	1048417					X		X
20	CONTROL PANEL	7747283	X	X	X	X	X	X	X
30	PROMIX M MIXING CHAMBER	7747253	X	X	X	X	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7746526	X	X	X	X	X	X	X
50	UNION, 1-1/2", SOCKET, PVC/VITON, SCH. 80	7744564	X	X	X	X	X	X	X
60	GLOBE VALVE, 1", SOCKET, PVC/EPDM	1048407	X	X	X	X	X	X	X
70	FLOW METER, 5 GPM, 3/4", FNPT, PVC, W\SWITCH	7746674	X						
	FLOW METER, 10 GPM, 3/4", FNPT, PVC, W\SWITCH	7746675		X	X				
	FLOW METER, 20 GPM, 1", FNPT, PVC, W\SWITCH	7746676				X	X		
	FLOW METER, 25 GPM, 1", FNPT, PVC, W\SWITCH	7746677						X	X
80	FLOW METER, 5 GPM, 1/2", FNPT, PVC	7746343	X						
	FLOW METER, 10 GPM, 1", FNPT, PVC	7746652		X	X				
	FLOW METER, 21 GPM, 1", FNPT, PVC	7746653				X	X		
	FLOW METER, 30.5 GPM, 1", FNPT, PVC	7746654						X	X
90	CHECK VALVE, 1", SKT, PVC	1048408	X	X	X	X	X	X	X
100	PRESSURE GAUGE, 316 SST, 0-160PSI	7745788	X	X	X	X	X	X	X
110	UNION, 1", SOCKET, PVC/VITON, SCH. 80	7744563	X	X	X	X	X	X	X
120	UNION, 1-1/2", FNPT, PVC/VITON, SCH. 80	7744559	X	X	X	X	X	X	X
130	STATIC MIXER, 1-1/2", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746529	X	X	X	X	X	X	X
140	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	X	X	X	X	X	X	X
150	BALL VALVE, 1", PVC/VITON, SCH. 80, TYPE 21	7741335	X	X	X	X	X	X	X
160	CALIBRATION COLUMN, PVC, 500mL	7500139	X	X	X	X		X	
	CALIBRATION COLUMN, PVC, 1000mL	7500130					X		X
170	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	X	X	X	X	X	X	X
180	BACK PRESSURE VALVE, 1/2", SOCKET, PVC, 0-150 PSI	1019883	X	X	X	X	X	X	X
190	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-160PSI	7745318	X	X	X	X	X	X	X
200	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X	X	X	X	X
210	HOSE CLAMP, 1/2", SST	7741354	X	X	X	X	X	X	X
220	TUBING, 1/2" ID, PVC, NYLOBRAID	7744091	X	X	X	X	X	X	X
230	INJECTION VALVE	7747244	X	X	X	X	X	X	X
240	BLEED VALVE, 1/8", PVC/VITON	7747237	X	X	X	X	X	X	X

P/N: 7747253 Mixing Chamber Components



PROMIX M - MIXING CHAMBER BILL OF MATERIALS P/N: 7747253

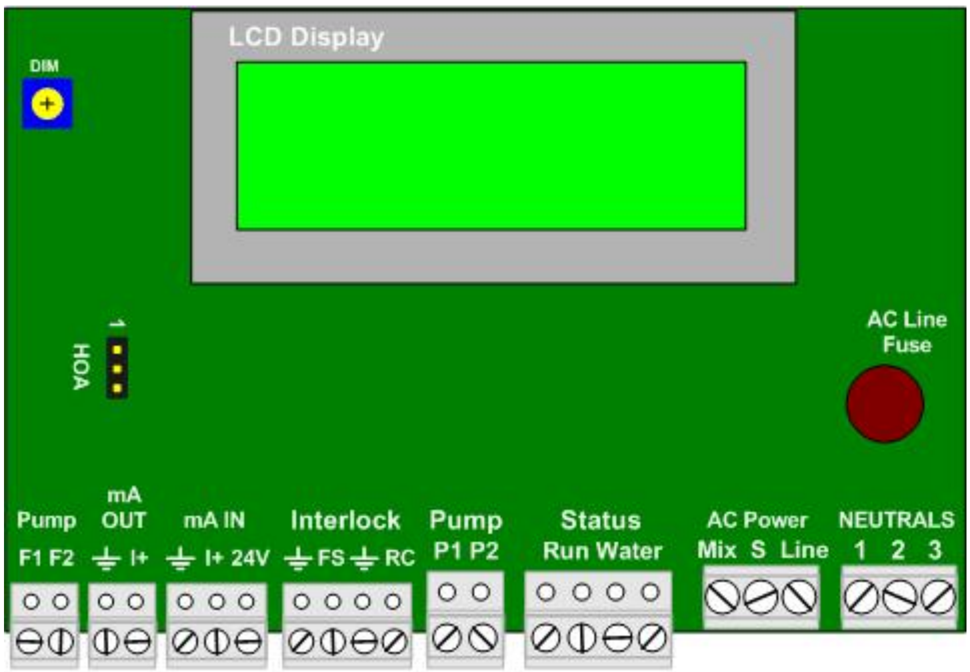
ITEM #	USA P\N	QTY.	DESCRIPTION
10	7746491	1	O-RING, CHAMBER, VITON, PROMIX-M
20	7747246	8	ROD, 316SS, 3/8-16 X 14.75, PROMIX-U
30	7746492	8	NUT, ACORN, 3/8-16, 18-8 SST
40	7747252	1	PLATE, TOP, PVC, 1.75, PROMIX-M, SG
50	7747270	2	INSERT, MALE, 1", PVC, PROMIX-M
60	7747288	2	O-RING, VITON, 1.174 ID X .103 CS, AS568B-123
70	7747272	2	RETAINER, MALE INSERT, 1", 316 SST, PROMIX-M
80	7747238	6	SCREW, 10-24X3/4", 18-8, HEX HEAD WITH WASHER
90	7747244	1	INJECTION VALVE, SG, PROMIX
100	7747239	1	RETAINER, INJECTION VALVE, 316 SST
110	7747237	1	VALVE, BALL, 1/8", MNPT X FNPT, PVC, VITON
120	7747245	1	MOTOR, 1 HP, TEFC, 115\230 VAC, 1 PH, 56C, BALDOR VWDL3510
130	7746478	1	FLANGE, MOTOR, C56/135, PROMIX-M
140	7500346	1	HOSE BARB, 1/16" MNPT X 3/16" ID, PVDF
150	7746484	1	SHAFT, MIXER, 303SS, PROMIX-M
160	851405	1	SCREW, SET, 316SS, 1/4-28 PROMIX-U
170	7746473	1	WASHER, 316SS, 1.88X.81X.09, PROMIX-M
180	7746472	1	BEARING, 440SS, 1.125X.5X.31, PROMIX-M
190	7746474	1	SEAL, MECH, SHAFT, 304SS, 1/2", PROMIX-U
200	7746497	3	ROD, 316SS, 3/8-16 X 8, PROMIX-M
210	7747249	3	SPACER, TOP BAFFLE, PROMIX-M
220	7747248	3	SPACER, BOTTOM BAFFLE, PROMIX-M
230	7747247	1	PIPE, DISCHARGE, PVC, 3/4" , PROMIX-U
240	7747251	1	BAFFLE, TOP, PVC, .25, PROMIX-S
250	7747250	1	BAFFLE, BOTTOM, PVC, .25, PROMIX-S
260	7746482	1	BLADE, PRIMARY, 316SS, PROMIX-M
270	7746483	1	BLADE, SECONDARY, 316SS, PROMIX-M
280	7746476	4	SCREW, SET, 316SS, 1/4-28 PROMIX-U
290	7746481	1	PROP, AGITATOR, CPVC, PROMIX-M
300	7746475	1	PIN, COTTER, 316 SST, 3/16 D X 1-1/4 L, MCMASTER 98355A235

Appendix B – Control Panel “A Controls”

B.1 Controller Board Layout

The controller consists of one circuit board.

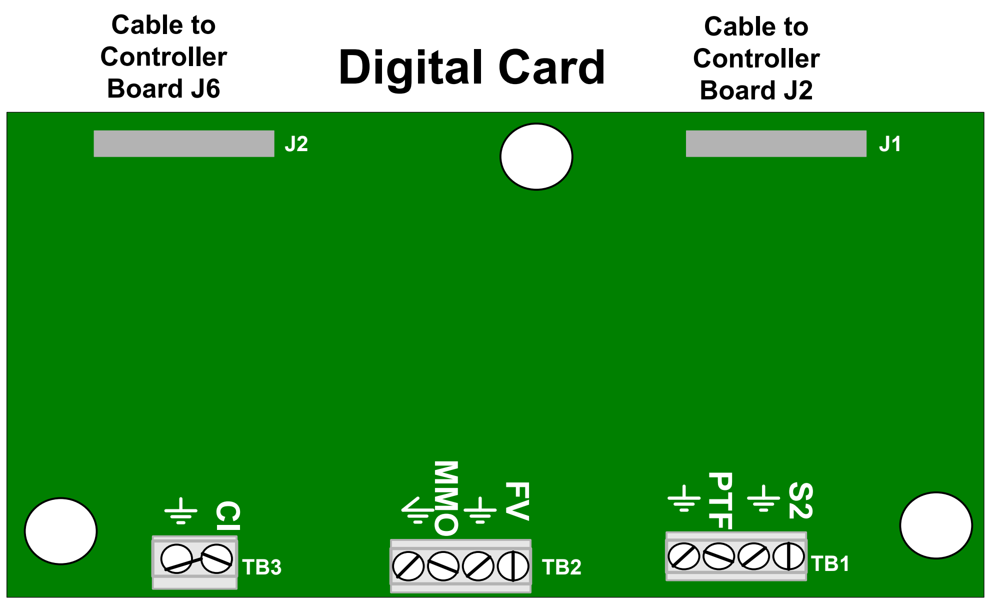
It includes a 2 line x 16 character LCD display and a microcontroller module.



All field terminations are to be landed on terminals as per Appendix Section B.2.

Auxiliary digital input card – Internal Connections:

1. Connect cable from Digital card J1 to Controller Board J2
2. Connect cable from Digital card J2 to Controller Board J6



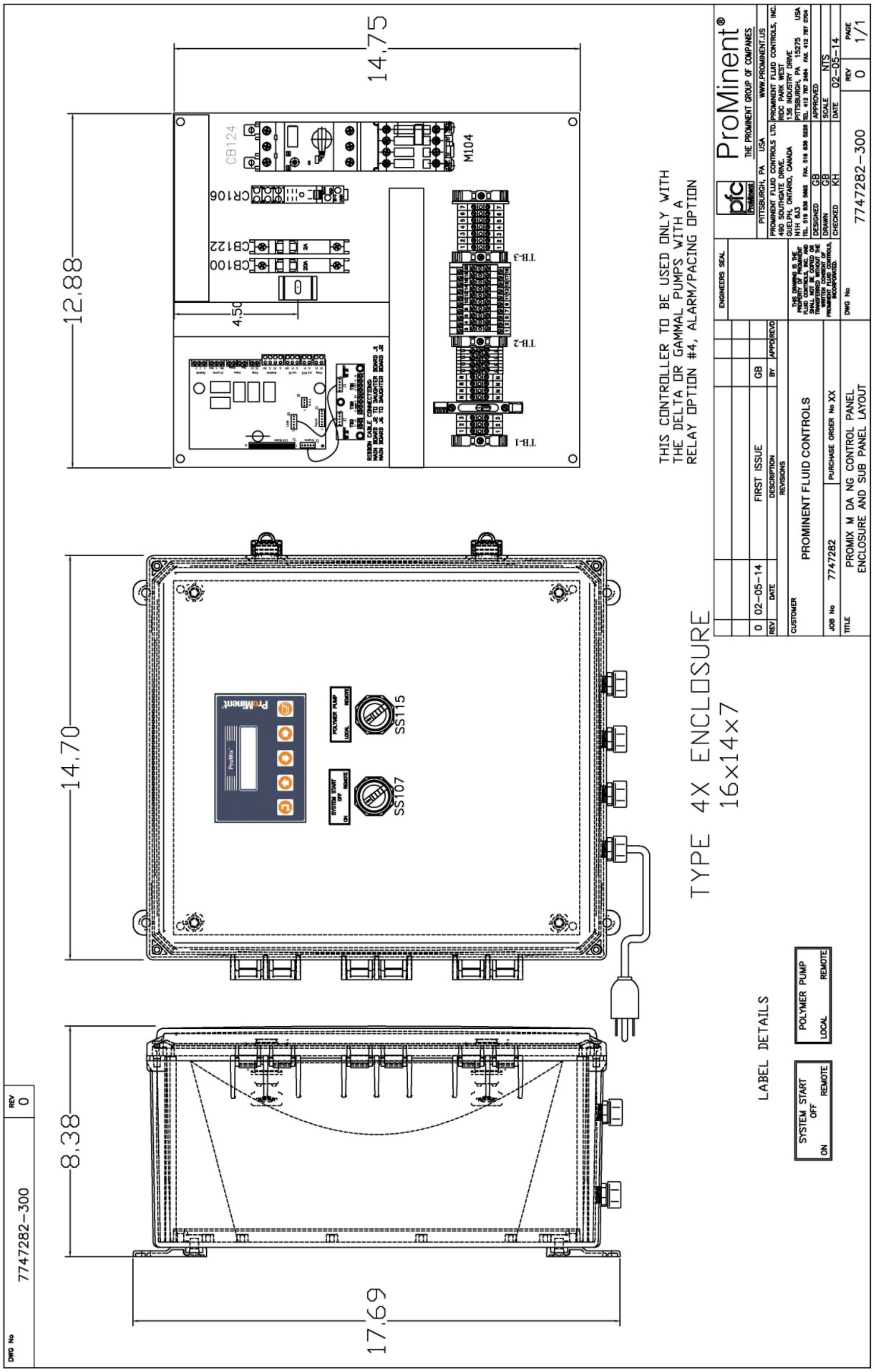
CI - configurable input (sometimes used for tank level)

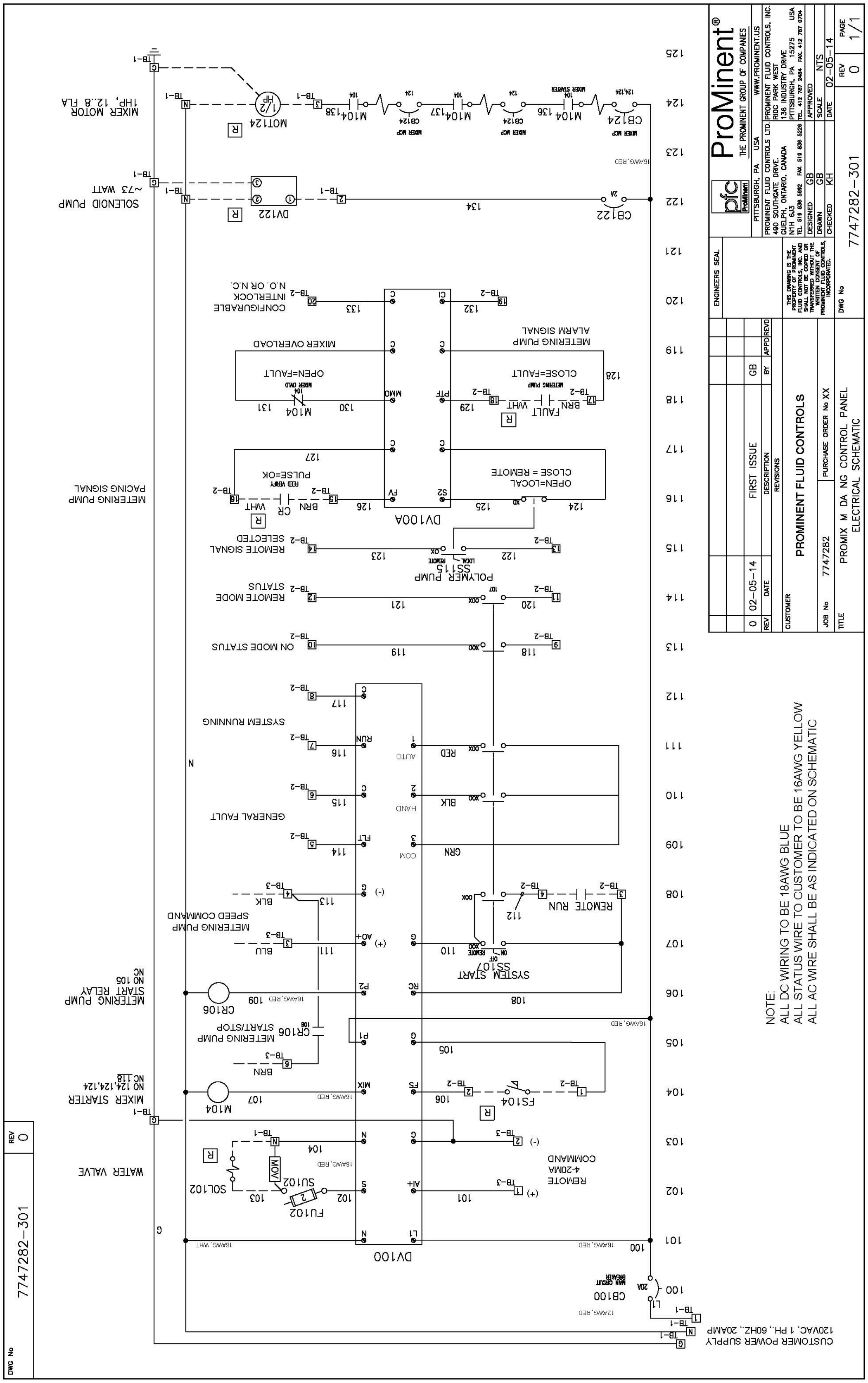
MMO – mixer motor overload
FV – feed verification

PTF - pump failure
S2 - interface to Polymer Pump door switch

FIELD WIRING

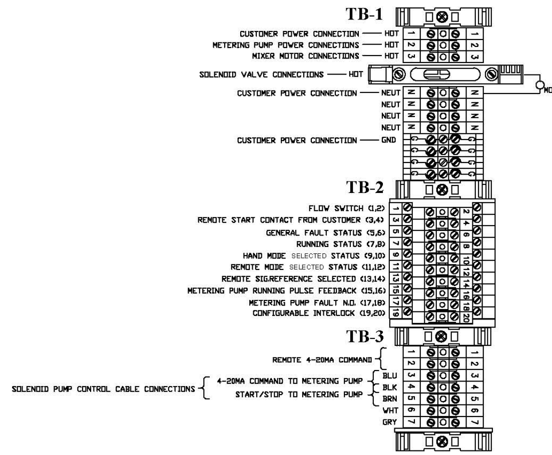
B.2 Controller Wiring (DA/PA Series)




NOTE:
ALL DC WIRING TO BE 18AWG BLUE
ALL STATUS WIRE TO CUSTOMER TO BE 16AWG YELLOW
ALL AC WIRE SHALL BE AS INDICATED ON SCHEMATIC
PROMINENT FLUID CONTROLS
PROMIX M DA NG CONTROL PANEL
ELECTRICAL SCHEMATIC
7747282-301

DWG No 7747282–302 | REV 0

TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
	1		7747277	INTEGRA	POLYCARBONATE TYPE 4X ENCLOSURE WALL–MOUNT ENCLOSURE NEMA 4X, 16 X 14 X 7 IN, WATER/DUST–TIGHT
		*1	7747192	INTEGRA	STEEL PANEL PAINTED WHITE
CB100	1		7746223	CBI	CIRCUIT BREAKER – MINIATURE 1–POLE CIRCUIT BREAKER 20 AMPS,120 VAC, 10KAIR UL 489
CR106	1		7746522	AB	DPDT RELAY 120VAC COIL, 8A CONTACTS
		*1	7746523	AB	RELAY SOCKET 700HN123
CB124/M104	1		7747276	C3 CONTROLS	MOTOR CIRCUIT PROTECTOR/CONTACTOR ASSEMBLY IEC ASSEMBLY W/ AUXILARY CONTACTS 10 – 16 AMP ADJUSTABLE 630–S12D10–2U16–F11
SS107	1		7745915	SQD	SELECTOR SW – 3 POS MAINT, NEMA TYPE 4X 30.5MM, 2–KA1 CONTACT BLOCKS
		*1	7745923	SQD	KA1 CONTACT BLOCK
SS115	1		7745921	SQD	SELECTOR SW – 2 POS MAINT, NEMA TYPE 4X 30.5MM, 1–KA1 CONTACT BLOCK
SU102	1		7745305	LITTLEFUSE	METAL OXIDE VARISTOR NEWARK # 58K7343 115Vrms AC, 153VDC,CLAMP 300V
TB–1	4		7746750	PHOENIX	TERMINAL – USLKG5, GROUND TERMINAL GREEN/YELLOW 26–10AWG SCREW CLAMP
TB–1	14		7746748	PHOENIX	TERMINAL BLOCK – UK5N SINGLE LEVEL FEED –THROUGH, 41AMPS 800V, 24–10AWG SCREW CLAMP
TB–2 TB–3	10		7746744	PHOENIX	TERMINAL BLOCK – UKK5N MULTI LEVEL FEED –THROUGH, 32AMPS 500V, 24–12AWG SCREW CLAMP
		*2	7746746	PHOENIX	MULTI LEVEL SPACER PLATE
		*5	7746751	PHOENIX	END BRACKET – E/NS 35N THICKNESS 9.5MM
FU103	1		7745052	AUTO DIRECT	FUSE TERMINAL DN–F6 1"x1 1/4" FUSES
		*1	7746094	FERRAZ SHAWMUTT	GLD2 TIME DELAY FUSE
	2		7500386	PFC	STOCK PRINTED LABELS
	1		7740819	PFC	POWER CORD 12FT, #14/3 AWG NEMA 5-15 PLUG
	5		2112	PFC	SKINTOP CABLE GLAND 1/2" NPT, UL LISTED
	2		53613250	PFC	SKINTOP CABLE GLAND INSERT 2 HOLE
	5		911371	PFC	SKIN TOP 1/2" NPT LOCK NUT
	1		7746655	PFC	PROMIX "S" CUSTOM CONTROLLER
	1		7746682	PFC	KEYPAD FACE PLATE FOR CONTROLLER WITH 8" CABLE
	1		7746684	PFC	TYCO 3–640440–3 PC BOARD RECEPTACLE
	A/R		7746685	PFC	3 CONDUCTOR 22AWG CABLE UNSHIELDED
	1		7735070	PFC	REMEKE STRAIN RELIEF RSP–106
	1		7735087	PFC	GALV ROMEX 1/2"NUT FOR STRAIN RELIEF
	A/R		7746532	PFC	PLUG FOR UNUSED CABLE GLANDS
	1		7760569	PFC	LCD HEADER FOR MICROFLEX
	1		7760286	PFC	DISPLAY 2X16 CHARACTER
	2		468734	PFC	COUNTER SUNK SCREW M2X20
	4		7760548	PFC	3/8" NYLON SPACER #6 THREADS
	4		7760554	PFC	SCREW 2–56 FLAT PHIL 3/4" LONG
	4		7760545	PFC	LOCKNUT #2–56
	7		7760546	PFC	NYLON FLAT WASHER #6
	6		7760549	PFC	1"X1/4" NYLON SPACER #6
	6		7760565	PFC	SCREW PAN HEAD #6–32X 1.5"
	3		7760407	PFC	HEX NUT #6–32
	2		7746538	PFC	36 POSITION 0.1 CONNECTION HEADER
	5		7760575	PFC	NYLON LOCK NUT #6–32
	1		7500422	DIGIKEY	16PIN, 16" RIBBON CABLE
	2		7746541	DIGIKEY	6 PIN, RIBBON CABLE
	2		7760556	PFC	SCREW 6–32 x 3/4"



SELECTOR OPERATION		
SW1 ON–OFF–REMOTE	SW2 LOCAL–REMOTE	"A" CONTROL
ON	LOCAL	SYSTEM ON– LOCAL KEYPAD CONTROLS PUMP OUTPUT
ON	REMOTE	SYSTEM ON – REMOTE 4–20MA FOR PUMP OUTPUT
REMOTE	LOCAL	SYSTEM START VIA REMOTE DRY CONTACT – LOCAL KEYPAD CONTROLS PUMP OUTPUT
REMOTE	REMOTE	SYSTEM START VIA REMOTE DRY CONTACT – REMOTE 4–20MA FOR PUMP OUTPUT

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CUSTOMER: PROMINENT FLUID CONTROLS

JOB No 7747282 | PURCHASE ORDER No

TITLE: PROMIX M DA NG CONTROL PANEL TERMINAL DETAIL AND BILL OF MATERIAL

ENGINEERS SEAL

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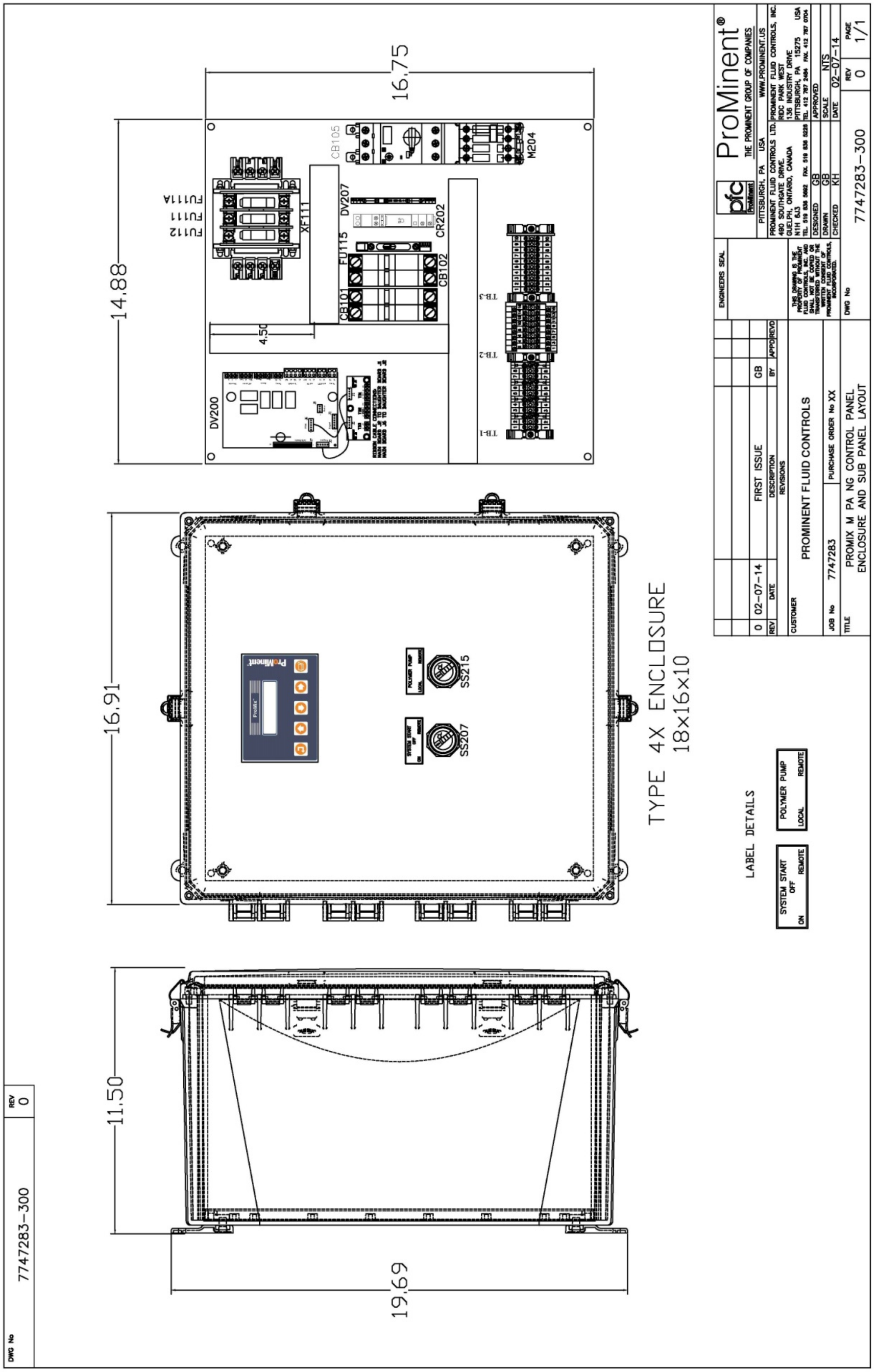
PITTSBURGH, PA USA WWW.PROMINENT.US

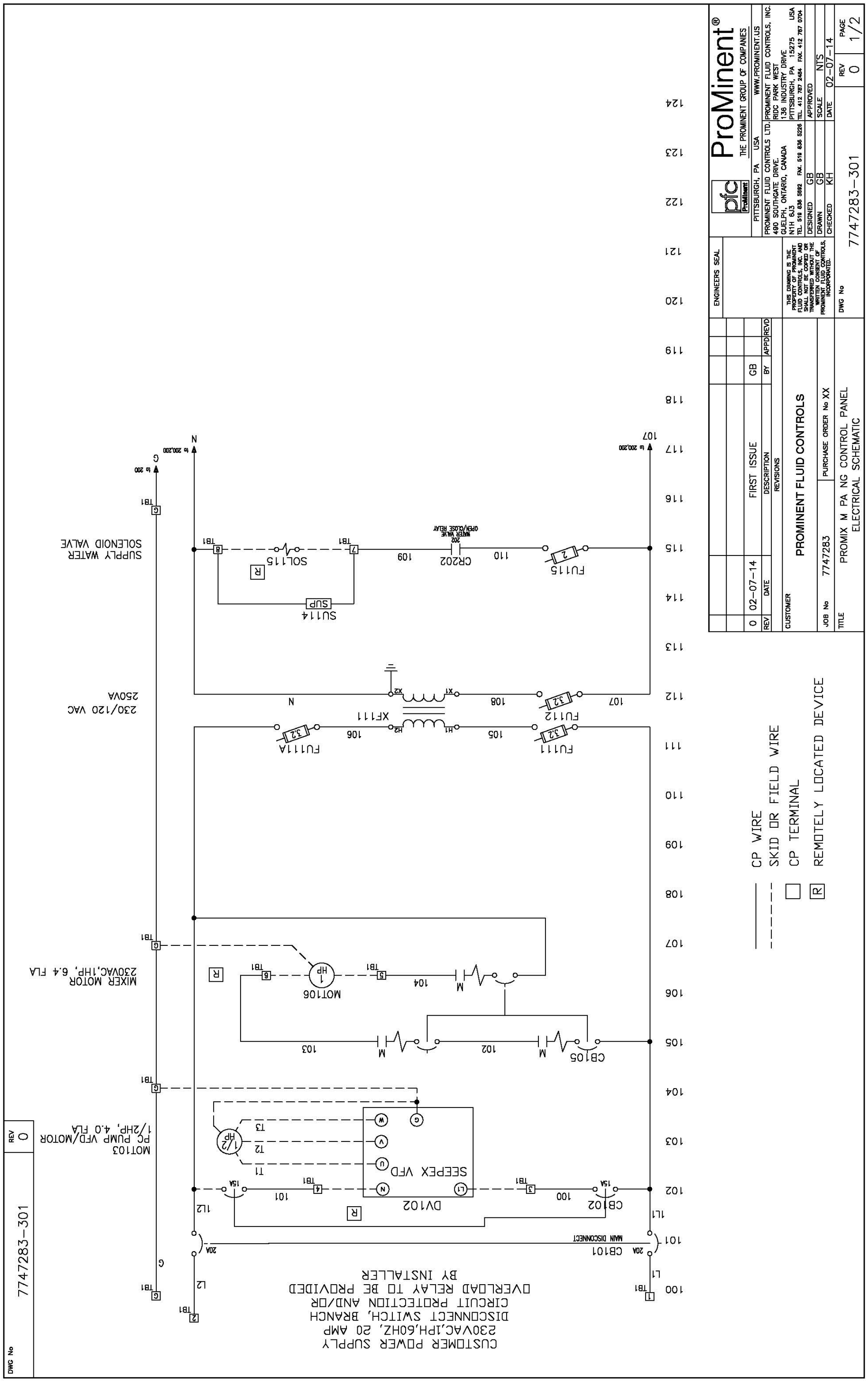
PROMINENT FLUID CONTROLS LTD. 490 SOUTHGATE DRIVE. GUELPH, ONTARIO, CANADA N1H 6J3 TEL. 519 836 5692 FAX. 519 836 5226

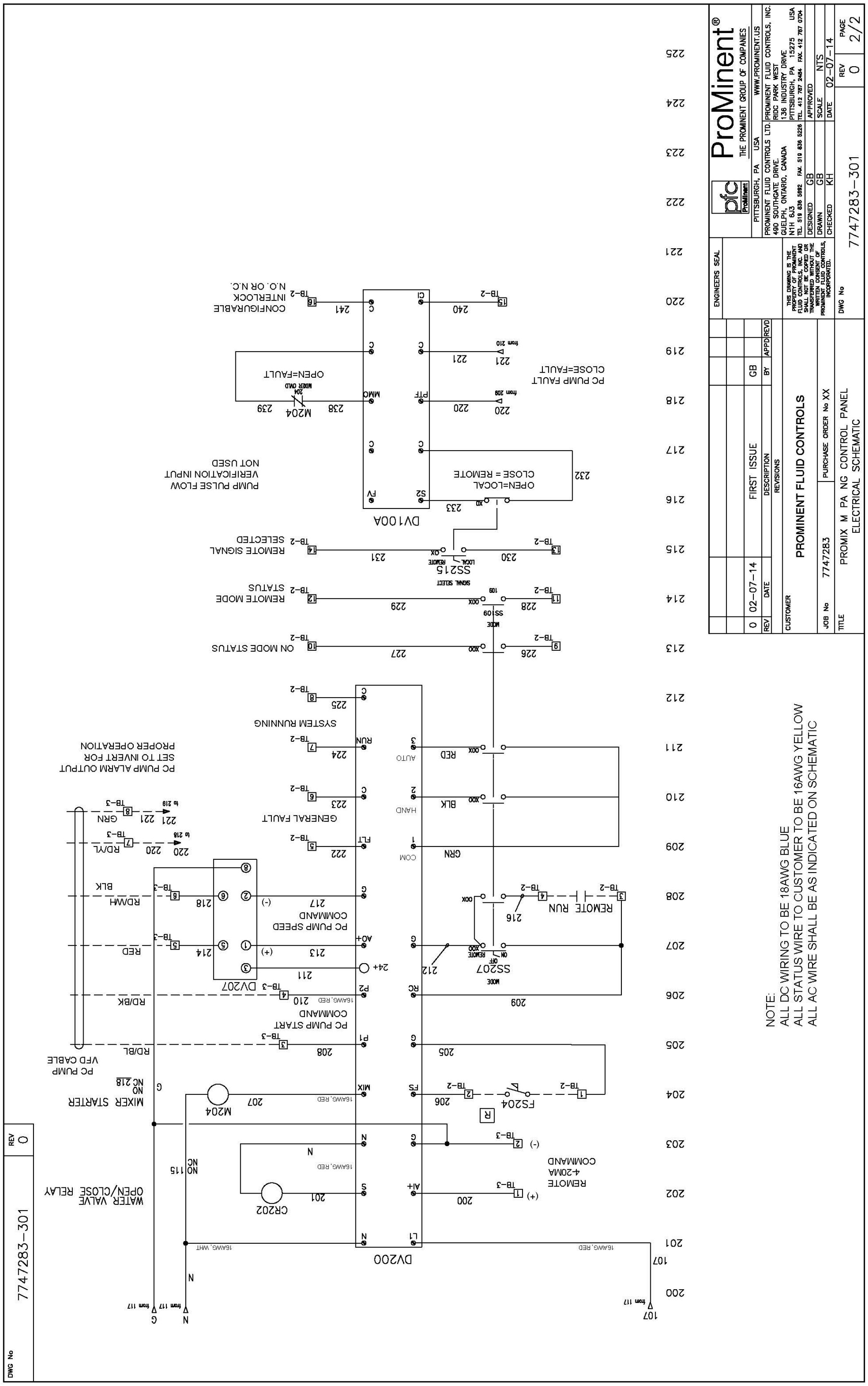
PROMINENT FLUID CONTROLS, INC. RIDC PARK WEST 136 INDUSTRY DRIVE PITTSBURGH, PA 15275 USA TEL. 412 787 2484 FAX. 412 787 0704

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DWG No 7747282–302 | REV 0 | PAGE 1/1

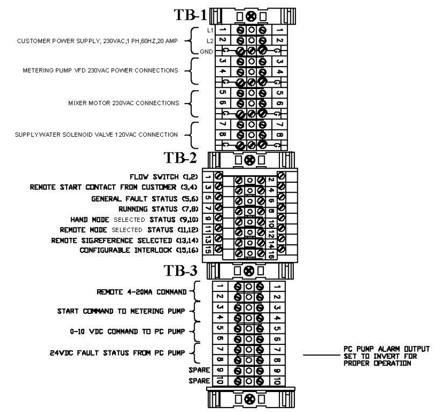

16.75
14.88
4.50
16.91
11.50
19.69
TYPE 4X ENCLOSURE
18x16x10
LABEL DETAILS
SYSTEM START
ON
OFF
REMOTE
POLYMER PUMP
LOCAL
REMOTE
SS207
SS215
DV200
DV207
XF111
FU111
FU111A
FU112
FU115
CB101
CB102
CB105
CR202
M204
TB-1
TB-2
TB-3
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PROMIX M PA NG CONTROL PANEL
ENCLOSURE AND SUB PANEL LAYOUT
7747283
7747283-300
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02-07-14
NTS
1/1


CUSTOMER POWER SUPPLY
230VAC,1PH,60HZ, 20 AMP
DISCONNECT SWITCH, BRANCH
CIRCUIT PROTECTION AND/OR
OVERLOAD RELAY TO BE PROVIDED
BY INSTALLER
MOT103
PC PUMP VFD/MOTOR
1/2HP, 4.0 FLA
SEEPEX VFD
DV102
MIXER MOTOR
230VAC,1HP, 6.4 FLA
MOT106
230/120 VAC
250VA
XF111
SUPPLY WATER
SOLENOID VALVE
SOL115
SU114
CR202
FU111
FU111A
FU112
FU115
CB101
CB102
CB105
CP WIRE
SKID OR FIELD WIRE
CP TERMINAL
REMOTELY LOCATED DEVICE
FIRST ISSUE
02-07-14
PROMINENT FLUID CONTROLS
7747283
PROMIX M PA NG CONTROL PANEL
ELECTRICAL SCHEMATIC
ProMinent
THE PROMINENT GROUP OF COMPANIES
7747283-301
02-07-14
1/2


NOTE:
ALL DC WIRING TO BE 18AWG BLUE
ALL STATUS WIRE TO CUSTOMER TO BE 16AWG YELLOW
ALL AC WIRE SHALL BE AS INDICATED ON SCHEMATIC
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02-07-14
7747283
7747283-301
DV200
DV100A
DV207
CR202
M204
FS204
SS207
SS215
WATER VALVE
OPEN/CLOSE RELAY
MIXER STARTER
PC PUMP
VFD CABLE
REMOTE 4-20MA COMMAND
REMOTE RUN
PC PUMP START COMMAND
PC PUMP SPEED COMMAND
GENERAL FAULT
SYSTEM RUNNING
PC PUMP ALARM OUTPUT
SET TO INVERT FOR
PROPER OPERATION
ON MODE STATUS
REMOTE MODE STATUS
REMOTE SIGNAL SELECTED
PUMP PULSE FLOW
VERIFICATION INPUT
NOT USED
OPEN=LOCAL
CLOSE = REMOTE
PC PUMP FAULT
CLOSE=FAULT
OPEN=FAULT
CONFIGURABLE
INTERLOCK
N.O. OR N.C.

DWG No 7747283−302 REV 0

TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
	1		7747278	INTEGRA	CUSTOM POLYCARBONATE TYPE 4X ENCLOSURE WALL−MOUNT ENCLOSURE NEMA 4X, 18 X 16 X 10 IN, WATER/DUST−TIGHT
		*1	7747193	INTEGRA	STEEL PANEL PAINTED WHITE
CB101	1		7745286	SQD	CIRCUIT BREAKER − MINIATURE 2−POLE CIRCUIT BREAKER 20 AMPS,120 VAC, 10KAIR UL 489
CB102	1		7745285	SQD	CIRCUIT BREAKER − MINIATURE 2−POLE CIRCUIT BREAKER 15 AMPS,120 VAC, 10KAIR UL 489
CR202	1		7746411	AB	HL TYPE TERMINAL BLOCK RELAY 110−125VAC/VDC 2 FORM C, 10A, DPDT, ELECTROMECHANICAL RELAY
CB105/M204	1		7747276	C3 CONTROLS	MOTOR CIRCUIT PROTECTOR/CONTACTOR ASSEMBLY IEC ASSEMBLY W/ AUXILARY CONTACTS 10 − 16 AMP ADJUSTABLE 630−S12D10−2U10−F11
SS207	1		7745915	SQD	SELECTOR SW − 3 POS MAINT, NEMA TYPE 4X 30.5MM, 2−KA1 CONTACT BLOCKS
		*1	7745923	SQD	KA1 CONTACT BLOCK
SS215	1		7745921	SQD	SELECTOR SW − 3 POS MAINT, NEMA TYPE 4X 30.5MM, 1−KA1 CONTACT BLOCK
SU114	1		7745305	LITTLEFUSE	METAL OXIDE VARISTOR NEWARK # 58K7343 115Vrms AC, 153VDC,CLAMP 300V
TB−1	4		7746750	PHOENIX	TERMINAL − USLKG5, GROUND TERMINAL GREEN/YELLOW 26−10AWG SCREW CLAMP
TB−1	20		7746748	PHOENIX	TERMINAL BLOCK − UK5N SINGLE LEVEL FEED −THROUGH, 41AMPS 800V, 24−10AWG SCREW CLAMP
TB−2 TB−3	10		7746744	PHOENIX	TERMINAL BLOCK − UKK5N MULTI LEVEL FEED −THROUGH, 32AMPS 500V, 24−12AWG SCREW CLAMP
		*2	7746746	PHOENIX	MULTI LEVEL SPACER PLATE
		*5	7746751	PHOENIX	END BRACKET − E/NS 35N THICKNESS 9.5MM
FU115	1		7745052	AUTO DIRECT	FUSE TERMINAL DN−F6 1"x1 1/4" FUSES
			7746094	MERSEN	GDL2 TIME DELAY FUSE
FU111 FU111A	2		7746582	MERSEN	TYPE CC FINGER SAFE FUSE BLOCK
		*2	ATQR3.2	MERSEN	TYPE CC FUSE FOR TRANSFORMER PRIMARY
FU112	1		7746584	MERSEN	MIDGET TYPE FINGER SAFE FUSE BLOCK
		*1	TRM3.2	MERSEN	TIME DELAY FUSE FOR TRANSFORMER SECONDARY
DV207	1		7746766	PHOENIX CONTACT	2813538 MCR−C−U/I−4−DC SIGNAL CONVERTER 24VDC INPUT 4−20MA OUTPUT 0−10VDC 3 WAY ISOLATION
XF111	1		9070TF250D1	SQD	GENERAL PURPOSE OPEN CORE 250VA TRANSFORMER 240/480 PRIMARY 120−240 SECONDARY
	2		7500386	PFC	STOCK PRINTED LABELS
	4		S2112	PFC	SKINTOP CABLE GLAND 1/2" NPT, UL LISTED
	3		53613250	PFC	SKINTOP CABLE GLAND INSERT 2 HOLE
	3		911371	PFC	SKIN TOP 1/2" NPT LOCK NUT
	1		7746655	PFC	PROMIX "S" CUSTOM CONTROLLER
		*1	7747289	PFC	PROMIX S I/O DAUGHTER BOARD
	1		7746682	PFC	KEYPAD FACE PLATE FOR CONTROLLER, 8" CABLE
	1		7746684	PFC	TYCO 3 PIN RECEPTACLE FOR H−O−A SWITCH
	A/R		7746685	PFC	3 CONDUCTOR 22AWG CABLE UNSHIELDED
	A/R		7746532	PFC	PLUG FOR UNUSED CABLE GLANDS
	1		7760569	PFC	LCD HEADER FOR MICROFLEX
	1		7760286	PFC	DISPLAY 2X16 CHARACTER
	2		7746458	PFC	TERMINAL ANGLE SUPPORT
	2		468734	PFC	COUNTER SUNK SCREW M2X20
	2		7760548	PFC	3/8" NYLON SPACER #6 THREADS
	2		7760554	PFC	SCREW 2−56 FLAT PHIL 3/4" LONG
	2		7760545	PFC	LOCKNUT #2−56
	5		7760546	PFC	NYLON FLAT WASHER #6
	6		7760549	PFC	1"X1/4" NYLON SPACER #6
	6		7760565	PFC	SCREW PAN HEAD #6−32X 1.5"
	3		7760407	PFC	HEX NUT #6−32
	1		7746538	PFC	36 POSITION 0.1 CONNECTION HEADER
	3		7760575	PFC	NYLON LOCK NUT #6−32
	1		7747273	PFC	22" DISPLAY CABLE
	2		7746541	DIGIKEY	6 PIN, 8" RIBBON CABLE
	3		7760556	PFC	SCREW #6−32 FLAT HEAD, PLATED 3/4 " LENGTH
	2		7745763	PFC	1/2" NPT SWIVEL CONNECTOR FOR LIQUID TITE
	2FT		7745762	PFC	1/2" BLACK LIQUID TITE



SELECTOR OPERATION		
SW1 ON−OFF−REMOTE	SW2 LOCAL−REMOTE	"A" CONTROL
ON	LOCAL	SYSTEM ON− LOCAL KEYPAD CONTROLS PUMP OUTPUT
ON	REMOTE	SYSTEM ON − REMOTE 4−20MA FOR PUMP OUTPUT
REMOTE	LOCAL	SYSTEM START VIA REMOTE DRY CONTACT − LOCAL KEYPAD CONTROLS PUMP OUTPUT
REMOTE	REMOTE	SYSTEM START VIA REMOTE DRY CONTACT − REMOTE 4−20MA FOR PUMP OUTPUT

REV	DATE	DESCRIPTION	BY	APPD	REVD
0	02−07−14	FIRST ISSUE	GB		

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CUSTOMER: PROMINENT FLUID CONTROLS

JOB No 7747283 PURCHASE ORDER No XX

TITLE: PROMIX M PA NG CONTROL PANEL TERMINAL STRIP DETAILS AND BILL OF MATERIAL

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PITTSBURGH, PA USA WWW.PROMINENT.US

PROMINENT FLUID CONTROLS LTD.
490 SOUTHGATE DRIVE.
GUELPH, ONTARIO, CANADA
N1H 6J3
TEL. 519 836 5692 FAX. 519 836 5226

PROMINENT FLUID CONTROLS, INC.
RIDC PARK WEST
136 INDUSTRY DRIVE
PITTSBURGH, PA 15275 USA
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B.3 4-20 mA Input Scaling

1. **Feeding More Polymer when the 4-20mA Input Current Decreases:**
   If you set **Scale Iin @ 4mA** to **4mA = 100%** and **Scale Iin @20mA** to **20mA = 0%**, the feeder will accommodate a logically inverted controlling 4-20mA current loop.
   However the default **Iin Fail State** is polymer pump OFF at 3.85mA.
   If a current signal <4.0mA does not represent a control loop fault at your site, you may wish to set the **Iin Fail State** to **Pump @ 100%.**

2. **Non-Zero % at 4.0mA & 100% @ <20mA:**
   To verify a non-standard 4-20mA input scaling, Set **Scale Iin @4mA** to **4mA = 20%** and **Scale Iin @ 20mA** to **12mA= 100%**.
   For a controlling current loop is at each of the following values:
   Greater than 12mA = 100% pump speed
   4.0mA =20% pump speed
   12 to 4mA = (100%-20%) x (mA-4)/(12-4)) + 20%
   Example: At 10.4mA control current: (80% x (10.5-4)/8) + 20% = 85% pump speed

3. **Correct Pump Response buy more Complex than needed:**
   If you also logically invert the 4-20mA pump response it may get confusing for you to verify the pump response to the 4-20mA input.
   If you set **Scale Iin @4mA** to **6mA = 100%** and **Scale Iin @ 20mA** to **16mA= 10%**
   16 to 6mA = (10%-100%) x (mA – 16)/6-16)) + 10%
   Example: At 13.6mA control current: (-90% x (10.5 - 4)/8) + 20% = 31% pump speed

   Few users will need to re-scale more than one of the current or percentage parameters. Many users will not have to re-scale the 4-20mA input; 4-20mA will be 0-100% pump speed.

4. **Dual Logical Inversion:**
   Be careful how you set the scaling currents and percentages. The effect is not always obvious.
   If you set **Scale Iin @4mA** to **20mA = 100%** and **Scale Iin @ 20mA** to **4mA= 0%**
   You’ve logically inverted both the control current and the pump response – you are then back to factory default span & control response
   This is not a fault but could be confusing to other users

5. **Keying Error Response:**
   Be aware not to accidentally set both the 4mA and 20mA scaling to the same values!
   For example if you set **Scale Iin @ 4mA** to **10mA = 100%** and **Scale Iin @ 20mA** to **10mA= 0%**, the feeder forces a 0.1mA difference
   If you set **Scale Iin @4mA** to **4mA = 50%** and **Scale Iin @ 20mA** to **20mA= 50%**, the feeder forces a 1% difference.

Correct any keying error prior to operating the ProMix M

Appendix C – Polymer Sizing / Dosage

The ProMix M Polymer Pump switch on the controller door enables the user to select either LOCAL or REMOTE operation. In ‘LOCAL’, the polymer pump speed is selectable from 0 - 100% using the controller keypad. In ‘REMOTE’, the polymer pump speed is controlled by a remote 4-20 mA signal representing 0 – 100%.

The desired polymer dosage must be considered prior to selecting the ProMix M model and pump speed. Typically the user will know how much polymer is required. This information is from jar tests or from prior experience. Otherwise the dosage can be derived from an initial manual calculation which must be adjusted based upon actual operation.

Below are typical guidelines to estimate polymer feed dosage:

1. For a Clarifier / Filter application:
   - A = MGD Plant Flow
   - B = ppm active polymer
   - C = desired solution concentration (%)

   (A*B)/24 = GPH active polymer

   GPH active polymer/C = Required dilution range

2. For a Sludge Dewatering application:
   User must have the following information to estimate GPH neat polymer:
   - A = GPM sludge
   - B = % solids (concentration)
   - C = lbs polymer per dry ton
   - D = percent active polymer
   - E = desired solution concentration (%)

   (((A*8.34)*B)*60)/2000 = Tons/Hr dry sludge

   (((Tons/Hr dry sludge*C)/8.34)/D)/E = Required dilution range

The polymer concentration from the ProMix M Polymer feeder is based upon the neat polymer pump rate divided by the total water flow through the primary and post dilution rotameters. For example, if the neat polymer feed rate is 1.5 gph and the flow through the primary rotameter is 15 gpm and the flow through the secondary rotameter is 10 gpm then the polymer concentration is:

((1.5 gph / 60) / (15 gpm + 10 gpm)) = 0.001 = 0.1%

Further post dilution is possible with equipment by others.

Appendix D – Reference Documents

Mechanical General Arrangement Drawings:

1048367	-200	ProMix M SG 300X2-2.3DA System
1048368	-200	ProMix M SG 600X2-3.8DA System
1048369	-200	ProMix M SG 600X2-6.2DA System
1048370	-200	ProMix M SG 600X2-10.3DA System
1048371	-200	ProMix M SG 1200X2-6.2DA System
1048372	-200	ProMix M SG 1200X2-10.3DA System
1048373	-200	ProMix M SG 1500X2-6.2DA System
1048374	-200	ProMix M SG 1500X2-10.3DA System
1048367	-200	ProMix M SG 300X2-2.3DA System

1048375	-200	ProMix M SG 300X2-5.0PA System
1048376	-200	ProMix M SG 600X2-5.0PA System
1048377	-200	ProMix M SG 600X2-10.0PA System
1048378	-200	ProMix M SG 1200X2-10.0PA System
1048379	-200	ProMix M SG 1200X2-24.0PA System
1048380	-200	ProMix M SG 1500X2-10.0PA System
1048381	-200	ProMix M SG 1500X2-24.0PA System

Electrical Schematic Drawings:

7747282-300	PROMIX-M Delta "A" Control Panel
7747283-300	PROMIX-M Seepex "A" Control Panel

Pump Manuals:

DLTA QSG	Delta Pump Quick Start Guide
986691	Delta Pump Operating Manual
	Seepex Pump Operating Manual

(Provided upon request)

Documents noted in this section are not in this manual

Appendix E - Keypad Menu Overview

